FROM BILLS ONLY TO OPERATION TWIST: A STUDY OF FEDERAL RESERVE OPEN MARKET OPERATIONS FOR THE PERIOD 1953-1964

By

PANOS KONSTAS

Bachelor of Arts
Michigan State University
East Lansing, Michigan
1960

Master of Arts
Michigan State University
East Lansing, Michigan
1962

Submitted to the Faculty of the Graduate School of
the Oklahoma State University
in partial fulfillment of the requirements
for the degree of
DOCTOR OF PHILOSOPHY
July, 1966

FROM BILLS ONLY TO OPERATION TWIST: A STUDY OF

FEDERAL RESERVE OPEN MARKET OPERATIONS

FOR THE PERIOD 1953-1964

Thesis Approved:

Thesis Adviser

Dean of the Graduate School

PREFACE

Open market operations are generally acknowledged as the main instrument of monetary management. In 1953, the Federal Reserve System established the policy of restricting its open market transactions to short-term securities. Whether this policy is referred to as the "bills only" doctrine or the "bills preferably" policy is, to a large extent, a matter of economic conviction. The former term has usually been used by critics of the policy, while Federal Reserve officials have described it as the "bills preferably" policy.

During the 1950's, no other issue in monetary policy, I believe, has been the subject of so much debate as the bills only policy. The study of the different points of view on this issue per se is of interest to monetary policy. Since, however, the Federal Reserve abandoned the bills only policy in 1961, the most pertinent question would seem to be whether there was any substance to the arguments presented by the critics and the defenders of this policy. My analysis of this question suggests that there was substance to certain of these arguments as the following pages will reveal.

To make this study, it was necessary to make use of certain statistical techniques, some of which required extensive calculations. I wish to express my gratitude to the Oklahoma State University Computing Center for their assistance in carrying out the statistical tests.

My primary indebtedness, however, is to Dr. Frank G. Steindl, my dissertation adviser, whose guidence and suggestions in preparing this study have been invaluable.

Thanks are also due to my wife who typed the various drafts and the final copy of this dissertation.

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF TABLES (Continued)

LIST OF FIGURES

CHAPTER I

INTRODUCTION

On February 7, 1961, the Federal Open Market Committee authorized the Federal Reserve Bank of New York "...to acquire for the System Open Market Account intermediate- and/or longer-term U. S. Government Securities having maturities up to 10 years..."[1]

Although the Committee's decision to authorize such purchases was not unanimous, it nevertheless brought to a close one of the most controversial issues in open market policy that had occupied the attention of academic economists and Federal Reserve officials for the previous eight years. In the early part of 1953 the Federal Open Market Committee had adopted the policy of restricting open market operations in all cases other than "correcting disorderly conditions" to short-term securities which in practice meant Treasury bills. In addition, the Federal Open Market Committee in 1953 had ruled that open market intervention should be kept to a minimum and should be undertaken only to provide increases or decreases in the money supply by changing member bank reserves. It was felt that these restrictions would result in an improvement of the technical performance of the

---

[1]Board of Governors of the Federal Reserve System, Forty-eighth Annual Report (1961), p. 39.

securities markets and also that the cost of credit under these conditions would reflect the unimpeded forces of supply of and demand for loanable funds.

The policy of restricting open market operations to short-term securities and keeping such operations to a minimum has generally been referred to by academic economists as the "bills only" doctrine. Federal Reserve spokesmen, on the other hand, have, with a few exceptions, referred to it as the "bills preferably" policy.

Ever since it first became known, the bills only doctrine attracted the attention and the scrutiny of a great number of economists and other students of monetary policy. For the most part, it was severely criticized as a needless impediment in the execution of monetary objectives which was arbitrarily imposed upon monetary authorities by none other than these same authorities.

The bills only doctrine was terminated in 1961 in order to enable monetary policy to meet certain domestic and international problems. The establishment and termination of the bills only policy gave rise to certain pertinent questions. First, was the bills only doctrine established on realistic assumptions? Second, did the bills only doctrine achieve its objectives? Third, had the abandonment of bills only made any contributions to the attainment of the objectives that monetary authorities pursued since 1961?

The consideration of these questions is the primary purpose of this dissertation. In addition, since open market policy with and without the bills only doctrine has been subject to lengthy discussions in recent years, the present dissertation is designed to provide a

description of the different points of view regarding open market policy and a record of open market operations in recent years.

Hypothesis of the Dissertation

The overall hypothesis of this study is that the arguments presented by the Federal Reserve in defense of the bills only doctrine were based upon erroneous assumptions and that the termination of this policy in 1961 resulted in greater flexibility in the use of open market operations as an instrument of monetary management which contributed to the achievement of certain monetary objectives during the period 1961-64.

The arguments presented in favor of bills only have been classified into theoretical and technical arguments. Theoretical arguments centered around the assumption that arbitrage and speculation transactions would quickly spread the effects of open market operations in short-term securities to other maturity sectors of the market. Technical arguments were associated with the Federal Reserve's desire to improve the functioning of the market for Government securities. On this point, the Federal Reserve notion was that System intervention in the open market should be held to a minimum and limited to bills only because uncertainty among dealers and other market participants as to when and in what maturity sectors the System may intervene prevented the development of "depth, breadth, and resiliency" in the market. The present study hypothesizes that the effects of operating in the short-term sector do not spread promptly to other maturity sectors and that the functioning of the securities market is not adversely affected

by either increased Federal Reserve intervention in the open market or by operations in longer-term issues.

With respect to the objectives of monetary policy during 1961-64, the hypothesis is that the efforts to raise short-term interest rates relative to long-term were generally successful and that the termination of bills only was one of the factors contributing to the attainment of these objectives.

Methodology

Various methods have been used to test the different issues involved in the overall hypothesis of this study. These methods are described in detail when the specific issues are evaluated. In a summary form, however, the methodology used is as follows:

(1) The question of whether the effects of operations in short-term securities spread to other maturity sectors has been evaluated by (a) the observance of weekly yield movements in security issues varying from a maturity of 91 days to over 10 years and through (b) simple and multiple correlation of the weekly yields and yield changes. High correlation among yields is considered as evidence that the effects of operations in Treasury bills permeate the other sectors of the market.

(2) The question of whether operations outside the short-term area have adverse effects in the technical functioning of the securities market has been evaluated on the basis of evidence offered by (a) dealer transactions and dealer

inventory positions in Government securities during the period 1960-64 and by (b) the comparison of yield fluctuations in various maturity issues for the periods 1956-60 and 1961-64.

(3) To determine whether or not the Federal Reserve was able to achieve its stated objectives during the period 1961-64, the author examined interest rates, yield curves, and other charts. The significance of the termination of the bills only policy is appraised by taking into account the existing theory of the term structure of interest rates and by examining the possible consequences that the continuation of the bills only policy might have had on the outcome of the 1961-64 monetary objectives.

Scope of the Dissertation

The scope of this dissertation is limited to the evaluation of issues and problems arising from Federal Reserve open market operations. Consideration has been given in certain cases to Federal Reserve actions involving the use of reserve requirements, discount rate changes, and selective credit controls. No attempt, however, has been made to evaluate the impact of these factors on the objectives of monetary policy. They have been considered rather briefly, primarily for the purpose of pointing out the relative reliance of the Federal Reserve on the different tools of monetary management during the period 1961-64.

Another important factor that influences the course of monetary objectives is Treasury debt management policies. This factor, also,

has been left out of the scope of this study, primarily because debt management and its relation to the Federal Reserve is an entirely different study.

The literature associated with open market operations since the introduction of the bills only policy has been quite extensive, especially during the period 1953-60. The most important writings on the subject are reviewed in Chapters II and III. In addition, Chapters II and III are designed to provide the essential background for the appraisal of recent open market policies. Thus, Chapter II deals with the development of the bills only doctrine and examines the arguments presented in favor of this policy both at the time of its adoption and when the doctrine was reappraised in 1958, while Chapter III examines some of the most important controversies arising out of the bills only policy and summarizes the theoretical issues involved in the term structure of interest rates.

Chapter IV examines the factors which led to the abandonment of the doctrine and reviews the economic conditions and the monetary policy developments of the period 1961-64. Particular emphasis is placed on open market operations. The annual volume of open market transactions for the period 1954-60 are compared with those of the period 1961-64. Also, open market operations according to maturity are contrasted in the two periods. Finally, in this chapter the issues which are to be tested are restated.

In Chapter V the first part of the hypothesis posed by this dissertation is subjected to examination. This is the part involving the question of whether changes in the short-term sector of the securities

market spread to other maturity sectors. This question is examined in great detail, mainly because the implications of this question are of utmost importance to monetary policy.

Chapters VI and VII deal with the other two questions of the hypothesis, namely the questions of whether the Federal Reserve succeeded in raising short-term yields relative to long-term and of whether the extension of open market operations to longer-term issues has affected adversely the performance of the securities market.

Chapter VIII presents a summary of findings and conclusions emerging from the study.

CHAPTER II

THE DEVELOPMENT AND RATIONALE OF THE BILLS ONLY DOCTRINE

Introduction

The bills only doctrine became public knowledge for the first time on April 13, 1953, during an address at a luncheon meeting of The Economic Club of Detroit by William McC. Martin, Jr., Chairman of the Board of Governors of the Federal Reserve System. This address was published, shortly thereafter, in the Federal Reserve Bulletin.[1] Chairman Martin briefly commented upon the role of the Treasury-Federal Reserve accord in establishing a free market in Government securities, and, in general, expressed his satisfaction with the way monetary policy had performed in the two years following the accord. The role of monetary management, as Chairman Martin saw it, was strictly that of providing bank reserves consistent with the needs of economic growth and price stability. In this respect, open market operations were not to be conducted for the purpose of influencing security prices, but rather for the purpose of maintaining an adequate amount of credit in the economy. Since securities of short duration are the closest substitutes for cash and their prices are least affected by

---

[1] William McC. Martin, Jr., "The Transition to Free Markets," Federal Reserve Bulletin, Vol. 39, No. 4 (April, 1953), pp. 330-335.

open market purchases or sales, the Federal Reserve had tried to confine its "...operations to short-term securities, in practice largely Treasury bills."[2]

Martin also mentioned, rather vaguely, that during 1952 an ad hoc subcommittee, under the authority of the Federal Open Market Committee, had been reviewing the Federal Reserve operations in the Government securities market "...with a view to determining what might be done to develop and improve those operations under the changed conditions."[3] He closed his address by indicating that a return to pegged markets would be undesirable and the coordination of monetary and fiscal policy would be capable of maintaining the "value of the dollar."

This chapter of the dissertation will be devoted to examining the reasons for the adoption of the bills only doctrine in 1953 and the re-evaluation and reaffirmation of the doctrine in 1958.

The Report of the Ad Hoc Subcommittee

The ad hoc subcommittee which Chairman Martin briefly mentioned in his speech was authorized by the Federal Open Market Committee on May 17, 1951, and its purpose was "...to study and report on the operations and functioning of the Open Market Committee in relation to the Government securities market."[4] This subcommittee was organized

---

[2]Ibid., p. 333.

[3]Ibid., p. 332.

[4]United States Congress, Joint Committee on the Economic Report, Subcommittee on Economic Stabilization, United States Monetary Policy: Recent Thinking and Experience, Hearings, Eighty-third Congress, Second Session (Washington, 1954).

in April and May, 1952 with William McC. Martin, Jr. as chairman. Beginning June 9, 1952, it held 29 sessions and meetings with securities dealers and other individuals familiar with the Government securities market. On November 12, 1952 the ad hoc subcommittee presented its findings and recommendations to the Federal Open Market Committee. The ad hoc subcommittee's report, however, was not made public until December 9, 1954, when another subcommittee--the Subcommittee on Economic Stabilization of the Joint Economic Committee on the Economic Report--held hearings on the efficacy of United States monetary policy. During those hearings the Federal Reserve's policy of bills only was discussed, and since the ad hoc subcommittee's report had provided the foundation of this policy, it was decided that that report should be released for publication. It subsequently was published in the same document which contained the hearings of the Subcommittee on Economic Stabilization.[5]

Findings of the Subcommittee

Starting with the proposition that an effective execution of open market policy requires the services of a well-organized Government securities market, the ad hoc subcommittee found that the existing organization of the securities market possessed the necessary elements for performing adequately its functions in every respect except one. The exception was in connection with the market's breadth, depth, and resiliency. The market lacked these characteristics. There seemed to

---

[5]Ibid., pp. 207-307.

be a great deal of "...confusion among professional operators in the market with respect to the elements they should take into consideration in the evaluation of future market trends, and to their apprehension over the attitude toward prices in the market on the part of the Federal Open Market Committee and of its representatives on the trading desk."[6] And in the subcommittee's opinion, this kind of confusion "...would not characterize a market that possessed real depth, breadth, and resiliency."[7]

The terms depth, breadth, and resiliency were explained as follows:

> In strictly market terms, the inside market, i.e., the market that is reflected on the order books of specialists and dealers, possesses depth when there are orders, either actual orders or orders that can be readily uncovered, both above and below the market. The market has breadth when these orders are in volume and come from widely divergent investor groups. It is resilient when new orders pour promptly into the market to take advantage of sharp and unexpected fluctuations in prices.[8]

The absence of depth, breadth, and resiliency, according to the subcommittee, was the result of ambiguities and contradictions in Federal Reserve actions and pronouncements. On several occasions, the Federal Open Market Committee by its actions had given the impression to market participants that while it was willing to allow yield and price fluctuations in the market, it was at the same time prepared to intervene in the market whenever the Committee considered it appropriate. Such actions, the subcommittee felt, caused a great deal of

---

[6] Ibid., p. 265.

[7] Ibid.

[8] Ibid.

uncertainty among professional dealers and other market participants. The dealers could only conclude that they were operating in a market which, besides being subject to fluctuations resulting from the forces of supply and demand for funds, was also subject to unpredictable interventions by the Open Market Committee. Thus, the dealers would not only have to bear the "...risk of being wrong in their evaluation of economic and market trends, but also of being wrong in guessing at what point the Open Market Committee might feel it necessary to intervene."[9] The net effect of these conditions, the subcommittee concluded, is that dealers become reluctant to take positions, i.e., to maintain sufficient volume of securities in their inventories, and the establishment of a broad, deep, and resilient market could not be realized.

No sector of the market is entirely characterized by breadth, depth, and resiliency, the subcommittee asserted. But, the short-term sector comes very close to meeting these characteristics. It is in the market for bonds that breadth, depth, and resiliency are entirely absent. In these long-term issues, "...quotations have fluctuated widely, either in response to relatively small buy or sell orders, or, more frequently, as a result of professional efforts to stimulate interest by marketing quotations up or down."[10]

Recommendations of the Subcommittee

In accordance with its findings, the subcommittee made certain recommendations centered around the development of greater breadth, depth,

---

[9]Ibid., p. 267.

[10]Ibid., p. 266.

and resiliency in the market. First, for the problem of the existing uncertainty and confusion among dealers with regards to Federal Reserve intentions, the subcommittee recommended that the Federal Open Market Committee "...keep its intervention in the market to such an absolute minimum as may be consistent with its credit policy."[11] The dealers then would know that the Federal Reserve could not unexpectedly and arbitrarily intervene for the "...purpose of establishing particular prices, yields, or patterns of yields."[12]

As to the case where intervention becomes necessary, that is, when the Federal Reserve needs to alter the volume of member banks' reserves through open market operations in order to influence the availability of credit in the economy, the technical functioning of the market in terms of breadth, depth, and resiliency would be disturbed the least if the intervention takes place at the short end of the market. The long-term sector is characterized, as indicated earlier, by wide fluctuations in yields and intervention in this area would undoubtedly result in greater reluctance on the part of the dealers to take risks. In the judgment of the subcommittee, therefore, an assurance given to the dealers by the Federal Open Market Committee to the effect that open market operations besides being kept at a minimum would also be restricted (with the exception of two cases to be noted below) to very short-term Government securities, i.e., Treasury bills "...would be reflected in greater depth, breadth, and resiliency in all sectors of the market."[13]

---

[11]Ibid., p. 266.

[12]Ibid., p. 267.

[13]Ibid.

The Two Exceptions

The first of the two exceptions for intervention outside bills was in connection with the then existing practice of the Open Market Committee intervening in the open market to support the prices of maturing issues for the purpose of enabling the Treasury to market new issues of comparable maturity with those that were maturing. The subcommittee felt that this practice could not be discontinued abruptly, but as soon as Federal Reserve and Treasury officials could work out new procedures for Treasury financing the Open Market Committee should refrain from such actions. This practice was abandoned in March, 1953.[14]

The second, and the most important, exception would be in connection with "disorderly markets." The executive committee of the Federal Open Market Committee was operating at the time the ad hoc subcommittee study was taking place under a directive which allowed intervention "for the maintenance of orderly conditions" in the securities market.[15] But such a directive, the subcommittee felt, "...can mean all things to all men, and in effect constitutes a blanket delegation of discretionary authority which can be interpreted to cover almost any action by the [executive] committee in the market."[16] The Federal Open Market Committee, therefore, should change the

---

[14]Board of Governors of the Federal Reserve System, Fortieth Annual Report (1953), p. 88.

[15]United States Congress, United States Monetary Policy: Recent Thinking and Experience, p. 268.

[16]Ibid.

directive to provide for the "correction of disorderly conditions" rather than the "maintenance of orderly conditions" in the securities market.

The subcommittee described "disorderly conditions" as the case when:

> ...selling feeds on itself so rapidly and so menacingly that it discourages both short covering and the placement of offsetting new orders by investors who ordinarily would seek to profit from purchases made in a weak market. There are occasions when such really disorderly reactions occur in the market. They may lead, if left unchecked, to the development of panic conditions. These must be corrected. In the judgement of the subcommittee, it is these circumstances, and these circumstances only, that the Federal Open Market Committee would be impelled, by its basic responsibilities for the maintenance of sound monetary conditions, to intervene, and intervene decisively, in other than the very short-term sector of the Government securities market.[17]

The Efficacy of Bills Only

The subcommittee recognized that the restriction of open market operations to bills only would impose a serious limitation on the Federal Reserve's freedom of action. This limitation, however, should not impair the effectiveness of monetary policy. As far as the subcommittee was concerned, the effects of open market operations, although initiated in the short end of the market, would spread quickly to other sectors in the form of price and yield changes.

> These changes would come about as a result of market arbitrage, i.e., the exercise of market skill by professionals who make up the market, the dealers who specialize in matching bids and offers and the professional managers of portfolios who are constantly balancing their investments to

---

[17] Ibid., p. 268.

> take advantage of shifts in prices and yields between the different sectors of the market.[18]

Furthermore, the confinement of open market intervention to bills only:

> ...would fall within, not without, the boundaries of the best central banking traditions...Traditional principles of central banking made no provision for operations in the intermediate or long maturities of any borrower.[19]

The Adoption of the Subcommittee's Recommendations

Although the ad hoc subcommittee presented its report on November 12, 1952, it was not until March 4-5, 1953, that the Federal Open Market Committee took action upon the subcommittee's recommendations.[20] The recommendations were unanimously approved by the Committee and correspondingly a new directive was issued to the executive committee outlining the rules which were to govern future open market policy. It was again emphasized that the restriction of open market operations to bills in other than disorderly situations would greatly enhance the effectiveness of monetary policy and would also lead to the development of a "freer" and more "self-reliant" market, that is, a market in which "...the allocation of available funds among various uses is affected through competition in the market."[21]

---

[18] Ibid., p. 267.

[19] Ibid.

[20] Board of Governors of the Federal Reserve System, Fortieth Annual Report, pp. 86-92.

[21] Ibid., p. 6.

The Reaffirmation of the Doctrine in 1958

The establishment of the bills only policy raised strong objections and criticisms from various quarters. But the Federal Open Market Committee continued to assert its confidence in the policy. During the 1957-58 recession, however, the criticism of the doctrine was intensified and the Federal Reserve was compelled to reappraise this policy. In this respect, an article appeared in the Federal Reserve Bulletin of November, 1958, whose explicit purpose was to:

> ...provide background against which to evaluate the suggestion that direct System intervention in the long-term market for United States Government securities might be helpful in situations other than those calling for correction of disorderly conditions in the market.[22]

The importance of this article lies in the fact that the Federal Reserve for the first time since the adoption of the doctrine presented to the critics a justification of bills only which was based almost entirely on theoretical considerations. Unlike the report of the subcommittee which started its analysis by examining the technical functioning of the securities market, Mr. Riefler's article began by considering the theoretical implications of open market operations with regards to security yields and prices in the various sectors of the market. Riefler observed that operations in Government securities affect the credit situation by bringing about changes in (a) the volume of available securities, (b) the volume of member bank reserves, and (c)

---

[22]Winfield W. Riefler, "Open Market Operations in Long-Term Securities," Federal Reserve Bulletin, Vol. 44, No. 11 (November, 1958), p. 1262.

the state of market expectations held by professional dealers and other investors.

Changes in Outstanding Securities

Federal Reserve intervention in the securities market will initially alter the supply-demand relationship of securities. The change in supply and demand will, in turn, affect the yields of securities. This would be true because when the Federal Reserve purchases securities in the market the volume of outstanding securities will decrease and the price of those securities remaining in the market will rise. Supply and demand changes will affect primarily the price of the particular issues that are bought or sold. Eventually, however, price changes will be registered "...in some degree throughout all maturity sectors of the market by reason of actual or anticipated substitution and arbitrage in the market."[23]

The way arbitrage works is illustrated in the following quotation:

> ...a withdrawal by outside investors of funds from the Treasury bill sector would be reflected in a rise in bill rates, both absolutely and in relation to rates on Treasury certificates. This might induce professional operators simultaneously to sell certificates and buy bills, a transaction which would tend to restore the previous relationship between yields on bills and certificates. At the same time, it would tend to leave both yields higher than they were before the initial action took place.[24]

Generalization of yield movements among all sectors is also facilitated because of "...the high degree of substitutability of security instruments that exists for many lenders and borrowers in the credit

---

[23]Ibid., p. 1262.

[24]Ibid., p. 1264.

and capital markets."[25] Lenders will want to place their loans in the sector of the market that offers the highest yield.[26] Borrowers, on the other hand, will try to minimize costs and will want to borrow from the sector where yields are the lowest. If they think that the cost of borrowing long-term funds is "too high" they may decide to wait and meet their needs through short-term borrowing from banks or other lenders. By so doing, the potential demand for long-term funds will be curtailed and the demand for short-term borrowing will be increased. Subsequently, the short-term interest rate will rise vis-a-vis the long-term rate.

Arbitrage and substitutability, according to Riefler, are the forces responsible for the high degree of "fluidity" which characterizes the market for Government securities.

Insofar as the bills only policy is concerned, a market characterized by a high degree of fluidity would imply that changes in yields and prices brought about by Federal Reserve intervention in "...the bill sector of the Government securities market soon spread to other sectors."[27]

---

[25]Ibid., p. 1265.

[26]According to Riefler, large commercial banks and managers of investment portfolios for insurance companies, trust funds, and pension funds will readily restructure their investments between maturity sectors if they think that such actions will increase their income.

[27]Riefler, p. 1266.

Changes in Bank Reserves

Open market operations affect prices and yields of securities not only because they change the supply or demand for securities but also because they change the reserves of member banks. Unlike the supply and demand changes where the relationship of open market operations to additions or subtractions of outstanding securities is one-to-one, that is, one dollar's purchases in the open market decreases by one dollar the amount of outstanding securities, the relationship of reserve changes to the potential change in the money supply is approximately one-to-seven, according to Riefler. This is so because the banking system operates on fractional reserves and Federal Reserve purchases or sales of securities add or subtract roughly seven times the amount of the purchase or sale to the potential supply of loans which becomes available through the member banks. Changes in the supply of loanable funds would, of course, influence the terms of lending, that is, the rate of interest. This is how variations in the reserves of member banks, in Riefler's view, affect the prices and yields of debt instruments. These effects on loans and yields will take place without regard to the way the change in reserves was accomplished. Reserves may have changed because of a change in reserve requirements, or a change in float, or open market operations. Their effects on loanable funds and security prices will not change. Riefler, therefore, concludes that "...the effects are the same irrespective of whether open market operations are conducted in the short- or the long-term sector of the market for Government securities."[28]

---

[28]Ibid., p. 1263.

This conclusion is not entirely correct. As was mentioned earlier, security yields are also affected by changes in the supply of securities and a direct intervention, for example, in the long-term sector by changing the supply of long-term bonds will have a different impact on long-term yields than if the intervention had taken place in short-term instruments in which case the supply of bonds would have remained unchanged. But, according to Riefler, the impact on interest rates or security yields of a change in the volume of securities is by far much weaker than the impact on these two factors of a change in reserves, because the impact of a change in outstanding securities reflects a one-to-one relationship whereas the impact of a change in reserves is a multiple one. Thus:

> ...if the Federal Reserve System buys or sells a given dollar amount of Treasury bills at a time when effective required reserves average one-seventh of demand deposits, something like seven-eighths of any resulting effect on market yields should reflect the changes in the volume of reserves available to the banks and only one-eighth the fact that the operation was executed in bills and therefore changed the volume of bills available for investment in the market.[29]

The policy implication of this analysis is that insofar as the yields of the long-term sector are concerned, not much of an advantage would accrue to monetary policy by executing operations directly in the long-term sector which could not be realized through operations in the short end of the market.

---

[29]Ibid., p. 1269.

The "Sluggish" Response of the Long-Term Sector

Critics of the bills only doctrine often contended that the long-term sector may not respond quickly to changes in the short-term sector. This contention, according to Riefler, can be explained by recognition of the fact that it takes time for banks whose reserve position has suddenly improved to start making loans available in the intermediate- or long-term area. "Ease in reserve position will not be quickly reflected in an increase of commercial bank investments in the long-term capital markets if banks generally are concerned about an insufficiency of short-term liquid assets or a high loan-deposit ratio."[30] If either condition prevails, it takes some time before the commercial bank can extend direct support to the long-term sector. But commercial banks "...would need this time interval before extending such support even if the Federal Reserve System itself operated in the long end of the market."[31] Again, the bills only policy is not to be blamed for any "sluggish" response in the long-term market with respect to changes in the availability of funds in the short-term market.

Changes in Expectations and Operations in the Long-Term Sector

If no significant advantages can be anticipated by the extension of open market operations to long-term securities, are there any distinct disadvantages in such an action? Indeed, there are, asserted Mr. Riefler. Open market operations, besides affecting the volume of

---

[30]Ibid., p. 1266.

[31]Ibid.

outstanding securities and the reserves of member banks, also affect the expectations of market dealers and other professionals. Often the expectations held by market professionals do not materialize, and the consequences of mistaken expectations are most serious when they concern the long-term market. Open market operations in the long-term sector "...give rise to expectations not only regarding the direction of general monetary policy but also regarding specific prices and yields of long-term securities."[32] This situation involves the risk that market professionals may take wrong positions which can lead to lower yields in the long-term sector than the actual supply and demand relationship in that sector would justify. When this happens, it becomes extremely difficult for the Federal Reserve to evaluate the effectiveness of its own actions and to determine its future operations. Confining open market operations to bills only does not present these problems because expectations in the long-term sector are not affected.

Thus, with respect to the merits of the suggestion that open market operations be extended to the long-term sector, Mr. Riefler concluded that:

> ...the lasting contribution of such additional use of direct intervention would be small, and under certain conditions there would be considerable risk that such action might not only obstruct the functioning of the market but also make it more difficult for the Federal Reserve to judge the adequacy of its own actions.[33]

---

[32] Ibid., p. 1264.

[33] Ibid.

Some Brief Comments on the Doctrine's Rationale

The introduction of the bills only policy came at a time when the bitter controversies with respect to pegging were still fresh in the memories of Federal Reserve officials and securities dealers. It is not surprising, therefore, that the ad hoc subcommittee study justified its recommendations primarily on the belief that their adoption would result in a freer Government securities market in which interest rates would be established by the forces of supply and demand for loanable funds. The subcommittee members were apprehensive of the idea of allowing the Federal Reserve to intervene in any sector of the market it chose. Such discretionary power, they felt, contained the danger of a return to a pegged market.

The analysis which led to the recommendations of the subcommittee was mainly based on technical considerations. That is, considerations which were related to the technical functioning of the securities market as measured by the degree of breadth, depth, and resiliency in the market. The theoretical considerations were limited to some brief remarks about traditional central banking practices and the role of arbitrage in the spreading of yields from one sector to another. At any rate, these theoretical points were only considered by the subcommittee in anticipation of criticisms of its recommendations and not as criteria for recommendations.

The 1958 reappraisal and reaffirmation of the doctrine was different from the 1953 justification of bills only in this respect. Whereas the 1953 case stressed the technical merits of bills only, the 1958 case stressed the short-comings of intervention in the long-term

sector. But there is also one similarity to be noted. In both the 1953 and the 1958 cases the idea of open market operations in long-term securities was in the final analysis rejected on the basis of behavioral assumptions. The 1953 report assumed that open market operations in the long-term sector create uncertainty among professional dealers. This is not much different from Mr. Riefler's assertion that intervention in long-term securities could give rise to mistaken expectations on the part of the dealers.

CHAPTER III

MAJOR CONTROVERSIES SURROUNDING BILLS ONLY

Introduction

As is often the case with important policy decisions, the bills only doctrine attracted a great deal of attention from those interested in monetary policy. Of those who studied the issues and the implications of the doctrine, very few failed to reach definite conclusions one way or the other. By far, the majority of academic economists expressed disapproval of the doctrine while Federal Reserve officials and securities dealers were in favor of it.

The writings approving or disapproving of the bills only policy are numerous. The present chapter is designed to review the most important of these writings.

In general terms, the controversies surrounding bills only may be classified into two main categories: Those dealing with the technical functioning of the securities market; and those considering the theoretical aspects of the doctrine.

Technical Arguments

Technical arguments were invariably linked to the performance of the securities market. Here again, two distinct types of controversies developed. One type was centered around the Federal Reserve's views on

breadth, depth, and resiliency in the securities market. The other dealt mainly with the question of whether the measures prescribed by the Federal Reserve for improving the technical performance of the market can also be consistent with the economic objectives of monetary policy.

The Question of Depth, Breadth, and Resiliency

The ad hoc subcommittee study, as indicated earlier, had asserted that the lack of depth, breadth, and resiliency was the result of dealers' uncertainty with respect to Federal Reserve intentions and, as a remedy, it had recommended the restriction of open market operations to short-term securities. The notion was promptly challenged by the Federal Reserve Bank of New York in its review of the subcommittee's report.[1] The New York Bank, first, questioned the validity of the subcommittee's contention that a high degree of uncertainty existed among dealers but could not offer any empirical evidence on the question. Even by assuming the existence of such uncertainty, however, the Federal Reserve Bank denied that the Federal Open Market Committee was responsible for it.

> ...it is the appraisals of the outlook for interest rates and security prices by dealers and investors, much more than any fear (or hope) of intervention by the System in the market for particular securities, that determine the

---

[1] United States Congress, Joint Committee on the Economic Report, Subcommittee on Economic Stabilization, United States Monetary Policy: Recent Thinking and Experience, Hearings, Eighty-third Congress, Second Session (Washington, 1954).

> "depth, breadth, and resiliency" of the market at any given time. Fear of adverse trends, or uncertainty as to what the trend is likely to be, is the predominant reason for thin markets, rather than apprehensions concerning System intervention in particular sectors to limit price movements.[2]

The remedy, then, that the ad hoc subcommittee recommended for improving the technical performance of the market would seem to be ill-founded. For, according to the Federal Reserve Bank of New York, the confinement of open market operations to bills would have no effect on the dealers' appraisals of interest rate trends and consequently it would also have no effect upon the market's depth, breadth, and resiliency.

It is not very easy to evaluate empirically these claims. The position of the ad hoc subcommittee, as well as that of the New York Bank, is based primarily upon assumptions related to the actual dealers' and investors' states of mind with regard to carrying larger inventories and making greater use of the Government securities markets. One is, therefore, tempted to accept the opinions of experts in this matter. But here, again, there is no unanimity. During the 1954 hearings of the Subcommittee on Economic Stabilization, for example, Chairman Martin stated: "Without any intervention from the Federal Open Market account, except in the short end, the market for United States Government securities has become progressively broader, stronger, and more resilient throughout all maturity ranges."[3] Allan Sproul,

---

[2]Ibid., p. 310.

[3]Ibid., p. 16.

on the other hand, who at that time was president of the Federal Reserve Bank of New York and vice chairman of the Federal Open Market Committee made this comment with respect to Chairman Martin's statement:

> The answer of the Chairman asserts that the market has become increasingly stronger, broader, and more resilient since the Committee adopted the "bills only" technique...I think it has lost depth, breadth, and resiliency, whether you view it in terms of dealer willingness to take position risks, volume of trading, or erratic price movements.[4]

In spite of the difficulties involved in measuring the degree of depth, breadth, and resiliency in the market, some economists have tried to appraise the effects of the bills only policy on the technical performance of the securities market.[5] The results of these attempts have been extensively reviewed by Daniel S. Ahearn.[6] He concluded that:

> The available statistical evidence and the view of market participants suggest that despite the "bills only" policy and contrary to Chairman Martin's assertions, the Government bond market in recent years has been thin and artificial. Thus the "bills only" policy would seem to have failed in one of its main purposes.[7]

---

[4]Ibid., p. 226.

[5]See for example, Dudley G. Luckett, "Bills Only: A Critical Appriasal," Review of Economics and Statistics, XLII (August, 1960), pp. 301-306.

[6]Daniel S. Ahearn, Federal Reserve Policy Reappraised, 1951-1959 (New York, 1963), pp. 53-64.

[7]Ibid., p. 62.

Bills Only and Conflicts in Goals

The Federal Reserve's stated objective of improving the securities market in terms of depth, breadth, and resiliency was also criticized on the grounds that it might be inconsistent with other objectives of monetary policy such as the control of credit. As was mentioned earlier, one of the reasons given for the justification of the bills only policy was that such a policy would reduce the dealers' risk and would enable them to carry larger inventories of securities, thus enhancing the functioning of the market. But, should the Federal Reserve be concerned with measures which tend to reduce the dealers' risk and uncertainty? During the period of pegging, for example, there was no risk involved since the dealers and other investors were assured that security yields would not change. The dealers, therefore, could carry a large volume of securities in their inventories without fear of incurring capital losses. Pegging the yields is quite obviously an excellent way of promoting depth, breadth, and resiliency in the market, but hardly consistent with the promotion of national economic objectives. Moreover, the dealers' self-interest is not always in harmony with the maintenance of orderly conditions in the securities market. In this respect, the Federal Reserve Bank of New York pointed out that:

> ...it must be remembered that the dealers are operating primarily with a view to making profits, and consequently that their inevitable tendency is to sell short and back away from offerings in a declining market and extend their positions in a rising market. Thus, instead of

> exerting a stabilizing influence on the market, they tend to accentuate its swings--at least over short periods.[8]

Therefore, the argument continued, the Federal Reserve should not be responsible for the technical functioning of the market, but instead it should concentrate on its economic objectives. The bills only policy, however, placed the improvement of the market on a higher level of importance than the promotion of credit and monetary policies needed to meet the problems of the economy. As the Federal Reserve Bank of New York correctly pointed out, "...where the two /market and economic/ considerations conflict, it must be assumed that the Federal Open Market will wish to follow the course of action most favorable to the latter."[9]

Theoretical Arguments

By far, the most severe criticisms of the bills only doctrine came out of theoretical considerations related to the term structure of interest rates. The importance of the rate of interest has, of course, seldom been underemphasized in economic theory. Most classical and neo-classical economists considered the rate of interest a real phenomenon. They thought that its determination depended entirely on the supply of real savings and the demand for investment. Furthermore, in their view, there was nothing the central bank could do to influence "the rate of interest." This idea, however, has been challenged in

---

[8]United States Congress, United States Monetary Policy: Recent Thinking and Experience, p. 310.

[9]Ibid.

recent years--primarily because of the works of John Maynard Keynes--and the possibility of the central bank exerting a positive influence in the determination of the interest rates has achieved wide acceptance among economists. Along the lines of classical and neo-classical thought, the ad hoc subcommittee had stated that the bills only policy "...would fall within, not without, the boundaries of the best central banking traditions."[10] Most academic economists, and a few from the Federal Reserve, accepted the truth of that statement and, accordingly questioned the wisdom of the doctrine.

There were two points of debate with respect to interest rates. First, there was the question of whether the Federal Reserve could pursue successfully the objectives of monetary policy by controlling the level of member bank reserves and letting the interest rates be determined by the market. Second, and most important, there was the question of whether the explanation of the relationship between the short-term and the long-term interest rates that the Federal Reserve had presented was correct.

Bank Reserves Versus Interest Rates

On many occasions the Federal Open Market Committee had indicated that the objectives of monetary policy are best implemented through the Federal Reserve's manipulation of member bank reserves. Even more emphatic was the Federal Reserve's assurance that it had no intentions of intervening in the open market for the purpose of establishing any

---

[10]Ibid., p. 267.

particular yields or patterns of yields. These pronouncements, however, do not imply that the Federal Reserve was not influencing yields and security prices. Bank reserve changes, as Riefler had explained, exert powerful influences on interest rates. The Federal Reserve pronouncements imply either that the Federal Reserve's conception of its responsibilities did not include any provisions for the use of interest rates as an instrument of monetary management or that the "rate of interest" may not be of central importance.

During the late 1940's and early 1950's, however, a new theory--primarily under the sponsorship of Robert V. Roosa--began to receive attention.[11] The new theory envisioned the possibility of the central bank exerting strong influence on the liquidity of the economy by slight changes in interest rates, and especially in the yield on long-term bonds. Unlike the Federal Reserve belief that the effects of changes in the bank reserves are mainly felt by the borrowers in the economy, the new theory stressed the importance that Federal Reserve actions have upon lenders. When, for instance, the Federal Reserve sells securities, the prices of these securities drop and their yields increase. The increase in yields (drop in prices) discourages security holders such as banks and other financial institutions from selling their securities because they are reluctant to incur capital losses. Without the increase in yields, however, these holders might have sold some of their securities and used the proceeds to make loans to private

---

[11]Ahearn, pp. 23-31; and Robert V. Roosa, "Interest Rates and the Central Bank," in Money, Trade, and Economic Growth (New York, 1951), pp. 270-295.

businesses. The assumption that bond holders are reluctant to sell when faced with a rising interest rate becomes more important when one considers the number of financial intermediaries that are not part of the Federal Reserve System and therefore cannot be controlled by the central bank so long as such control is limited to bank reserves. But, when the central bank's control extends to interest rate manipulations, all these financial intermediaries would come under its influence since financial intermediaries, as a rule, are important holders of Government securities.

For maximum effectiveness, the Federal Reserve should be willing to buy or sell long-term securities in the open market.[12] In addition, the new theory would lead to the implication that the Federal Reserve recognize the long-term interest rate as an important tool of monetary control. This theory of monetary control attracted wide popularity during the time the bills only doctrine was being considered. It has been referred to in the literature most often as the "availability doctrine," but it has also been known as the "Roosa doctrine" and as the "lock-in effect." Although many shortcomings of this doctrine have been exposed at various times,[13] it nevertheless constituted an important alternative to the actual policy adopted in March, 1953.

---

[12]Ahearn, p. 28.

[13]See Ibid., pp. 29-32; and James Tobin, "A New Theory of Credit Control: The Availability Thesis," The Review of Economics and Statistics, Vol. XXXV, No. 2 (May, 1953), pp. 118-127.

In fact, during the 1952 ad hoc subcommittee hearings a policy providing for Federal Reserve intervention in the long-term sector had been proposed as an alternative to the bills only doctrine. Under this policy, the Federal Open Market Committee would:

> ...permit the interplay of market forces to register on prices and rates in all the various maturity sectors of the market but would /also/ stand ready to intervene with direct purchases, sales, or swaps in any sector where market developments took a trend that the Committee considered was adverse to high level economic activity.[14]

This plan, however, was rejected in preference to bills only because "...it did not appear to offer real promise of removing obstacles to improvement in the technical behavior of the market."[15]

It has also been suggested that the real reason for the Federal Reserve's reluctance to extend its influence on interest rates directly was the fear that such an action would inevitably result in pegged markets,[16] and a fair amount of evidence has been presented in this respect. But, regardless of the merits of this suggestion and the technical considerations with respect to the securities market, the Federal Reserve could in the last resort claim that no direct intervention on interest rates was necessary by reason of Riefler's argument with respect to bank reserves and its own conception of the role of

---

[14]United States Congress, United States Monetary Policy: Recent Thinking and Experience, p. 22.

[15]Ibid., p. 23.

[16]Ahearn, pp. 37-43.

arbitrage. It was, thus, in this area--the relationship between short- and long-term yields--that a substantial part of the case for bills only could be effectively evaluated.

The Term Structure of Interest Rates

The relationship between short-term yields and long-term yields has usually been referred to as the term structure of interest rates. The understanding of the determination of this relationship is extremely important for prescribing any particular open market policy. Both the ad hoc subcommittee study and Riefler's analysis in 1958 placed a great deal of emphasis on the mechanism of arbitrage for transferring yield movements from one sector of the market to another. But in the last 20-25 years a number of theories have been advanced regarding the determination of the term structure of interest rates which are not always consistent with the notions that the Federal Reserve accepted on this matter.

The question of the determination of the term structure of interest rates was originally investigated by F. A. Lutz[17] and J. R. Hicks.[18] In more recent times among those who have dealt extensively

---

[17]F. A. Lutz, "The Structure of Interest Rates," Quarterly Journal of Economics, Vol. 55 (November, 1940), pp. 36-63.

[18]J. R. Hicks, Value and Capital, 2nd Ed. (London, 1946), Chapter 11.

with this subject are J. M. Culbertson,[19] Joseph W. Conard,[20] and David Meiselman.[21] Common to all these works is the "expectations theory" of the term structure of interest rates.[22] According to this theory, "...the yield to maturity on any long-term security will be approximately equal to an average of the short-term rates expected to rule over the remaining life of the security."[23] More explicitly, the yield of a security issued today and maturing three years from now should be approximately equal to the average of: (a) the present yield on securities issued today and maturing one year from now; (b) the expected yield on securities to be issued one year from now and maturing two years from now; and (c) the expected yield on securities to be issued two years from today and maturing three years from now. This conclusion follows from the assumption of the existence of arbitrage and speculation in the securities market. The following example clarifies this point. Suppose that the rate of interest (r_1)

---

[19] J. M. Culbertson, "The Term Structure of Interest Rates," Quarterly Journal of Economics, Vol. 71 (November, 1957), pp. 485-517.

[20] Joseph W. Conard, An Introduction to the Theory of Interest (Berkeley, 1959), pp. 287-367.

[21] David Meiselman, The Term Structure of Interest Rates (Englewood Cliffs, N. J., 1962).

[22] The terminology employed by the different authors is by no means uniform. What, for example, Meiselman calls the "expectation theory" has been referred to by Conard as the "neoclassical theory." See Conard, p. 294.

[23] Ibid.

on one-year loans due one year from now is two percent and the expected rate of interest (r_2^e) on the one-year loans due two years from now is four percent. Then on the basis of the expectations theory the interest rate (R_2) on the two year loans due two years from now should be:

$$R_2 = \frac{r_1 + r_2^e}{2} = \frac{2 + 4}{2} = 3 \text{ percent}$$

Instead of R_2 being three percent, assume that it is two percent. Then through arbitrage, profits can be expected to be realized by simultaneously borrowing for two years and lending for the first year at two percent and for the second year at four percent. If the amount involved was \$100 the borrowing cost would come to \$4 while the expected lending income would be \$2 + \$4 = \$6, thus netting a profit of \$2. Of course, R_2 cannot remain indefinitely at two percent. The increasing demand for two-year loans on the part of those engaging in arbitrage will eventually force R_2 to three percent. Only at this rate borrowers as well as lenders will be indifferent between one-year and two-year loans.

The policy implication of the expectations theory is that, since long-term rates of interest depend upon expected future short-term rates, open market operations in long-term securities will not influence the structure of interest rates if such operations do not alter expectations. Changes, however, in short-term rates will alter long-term rates.

The Federal Reserve did not explicitly present the expectations theory as a theoretical justification of its open market policy, but

its notions and remarks regarding the relationship of short- and long-term securities would indicate a substantial degree of agreement with the expectations theory.

The validity of the expectations theory is ultimately linked to the question of whether perfect arbitrage is possible in the securities market. And there are a variety of reasons why arbitrage may be prevented from materializing. The dealers' commission costs and the cost of maintaining a staff of specialists to watch for yield differentials in the various sectors of the market may prevent idle funds from entering the securities market. A second reason is that many institutions have funds available for only short periods of time and in such cases it may be customary to invest only in short-term securities. Another reason arises from what Conard refers to as "market segmentation."[24] Certain institutions:

> ...place their funds in investments whose maturities are similar to the life of their own liabilities so that the likelihood of a forced prematurity sale on the one hand, or frequent reinvestment on the other, is small. Life insurance companies, for instance, typically invest in long-term securities, commercial banks in short and intermediate bonds (mostly governments), and so forth.[25]

Besides the institutional factors, there are other important considerations which make the expectations hypothesis unsatisfactory. In this respect, J. R. Hicks has presented the argument[26] that while certain borrowers who are embarking on long-term projects may wish to

---

[24]Ibid., p. 304.

[25]Ibid.

[26]Hicks, pp. 146-147.

secure funds on long-term basis in order to avoid the risk of fluctuating interest costs which would be inherent in short-term borrowing, lenders in general will not want to commit their funds for long periods of time unless some extra compensation was offered to them. And:

> ...If no extra return is offered for long lending, most people (and institutions) would prefer to lend short, at least in the sense that they would prefer to hold their money on deposit in some way or other. But this situation would leave a large excess of demands to borrow long which would not be met. Borrowers would thus tend to offer better terms in order to persuade lenders to switch over into the long market...[27]

This analysis leads to the conclusion that long-term rates do not equal the average of expected future short-term rates but they exceed this average by a liquidity or risk premium which is necessary to induce lenders to enter the long-term market.

There have been several empirical studies concerned with the structure of interest rates--especially in recent years. F. A. Lutz in his 1940 article rejected the expectations hypothesis and one of his conclusions was that, "...the central banks must try to influence the long rate directly, if they want to regulate investment."[28] Similarly, J. M. Culbertson after studying the behavior of short- and long-term yields for the period 1920-1957 found the expectations theory unsatisfactory in the explanation of the term structure of interest rates and, instead, he stressed the importance of institutional factors

---

[27]Ibid., p. 147.

[28]Lutz, p. 60.

as well as the "liquidity premium" argument.[29] On the other hand, a study of yields and yield curves by J. W. Conard covering the period 1951-54 led him to the conclusion that, despite the institutional rigidities of the market, the market participants operating on the basis of expectations control a large enough proportion of total transactions in the market so that the expectations theory constitutes an accurate description of the term structure of interest rates.[30]

Another empirical study which has received considerable attention in recent years is that of David Meiselman. Meiselman tested a number of theories concerning the term structure of interest rates by making use of annual data on basic yields of default-free corporate bonds for the years 1900-1954. The tests indicated that neither the "segmentation" argument nor the Hicksian risk-premium argument are very important in the determination of the structure of interest rates, and the theory consistent with the evidence is the expectations hypothesis.[31]

Insofar as the bills only doctrine is concerned, Meiselman's findings indicate that any Federal Reserve policies which alter the maturity composition of the System's portfolios will have no long-run effect upon the term structure of interest rates unless such actions also affect expectations of future rates.[32] Expectations as to future

---

[29]Culbertson, pp. 488-489.

[30]Conard, pp. 356-360.

[31]Meiselman, p. 60.

[32]Ibid., p. 49.

rates, according to Meiselman, will be revised by the market participants if their previously held expectations do not materialize. That is, market participants learn from their mistakes and when their anticipations about future rates are not realized they revise their present estimates regarding future rates.[33] The advisability, therefore, of Federal Reserve operations in long-term securities under the expectations hypothesis would seem to hinge on whether or not such operations cause a revision of expectations about future rates. Meiselman does not explore this question, but J. H. Wood, while reviewing Meiselman's work, expressed the view that open market operations in long-term securities by altering the maturity composition of the securities held by the Federal Reserve will cause a change of expectations on the part of market participants. In Wood's words:

> Meiselman's model provides us with the description of a mechanism by which such government activities [i.e., those changing the composition of Federal Reserve portfolios] must affect expectations and therefore the structure of rates. If the Federal Reserve performs a swapping operation whereby long rates are driven upward and short driven downward, Meiselman's error term...will be affected, causing a different revision of expectations than would have been the case in the absence of government activities and thereby inducing a different relation between long and short rates than would have existed had the swapping operation not occurred.[34]

From this Wood concludes that the expectations hypothesis "...does not

---

[33] Ibid., p. 30.

[34] J. H. Wood, "Expectations, Errors, and the Term Structure of Interest Rates," The Journal of Political Economy, Vol. LXXI (April, 1963), pp. 170-171.

imply that changes in the maturity composition of outstanding debt will have no influence on the term structure of interest rates."[35]

In closing, it may be useful to point out that while exponents and opponents of the expectations hypothesis have devoted a great deal of their efforts to presenting arguments and empirical evidence contradicting and supporting the assertion of perfect arbitrage in the securities market, hardly any attention at all has been given to the question of how much time is required before arbitrage can transfer the yield changes in the short-term sector to the long-term sector of the market, i.e., the fluidity consideration. It would seem that the length of the time-lag involved in yield changes between short- and long-term securities should be of the utmost importance in monetary management--especially in cases where the timing of monetary policy actions plays a crucial role. For some reason, however, this time-lag has been neglected in the studies of interest rate relationships.

A Recapitulation of the Arguments

The present chapter dealt with major issues of controversy in the bills only doctrine. These issues were divided into technical and theoretical. In the technical category, the Federal Reserve's diagnosis of what causes the lack of depth, breadth, and resiliency in the market and the remedies prescribed by the Federal Reserve for the promotion of greater depth, breadth, and resiliency were examined by the

---

[35]Ibid., p. 171.

Federal Reserve Bank of New York. The New York Bank argued that the Federal Reserve's conception of the reasons for the lack of depth, breadth, and resiliency were erroneous. The depth, breadth, and resiliency of the market, according to the New York Bank, was determined by the dealers' evaluation of future interest rate trends, and not by the degree of confidence or certainty that these dealers held with respect to Federal Reserve intentions for open market intervention. In addition, the acceptance of the technical improvement of the securities market as one of the major objectives of the Federal Reserve could conceivably run into conflict with other major goals of monetary policy.

The theoretical arguments were concentrated around the questions of (a) whether the Federal Reserve should try to control both bank reserves and interest rates and (b) whether arbitrage is sufficiently strong to transfer yield changes from the short- to the long-term sector of the market. The availability doctrine and others along the same lines implied that the goals of monetary policy are better served when the Federal Reserve extends its responsibilities to include some control of interest rates. The answer to the second question involves the consideration of the term structure of interest rates. The Federal Reserve's notions in this respect were related to the expectations hypothesis which generally views short- and long-term securities as perfect substitutes.

Empirical studies on the expectations hypothesis are again in disagreement. The most systematic of these studies--the one by Meiselman--indicates that the expectations hypothesis can explain

adequately the relationship between short- and long-term securities. But as Wood has pointed out, Meiselman's conclusions do not destroy the case for open market operations in long-term securities. It would, therefore, seem that an open market policy based entirely on operations of short-term securities--apart from technical considerations--cannot be defended strictly on theoretical grounds.

CHAPTER IV

THE TERMINATION OF BILLS ONLY AND THE ECONOMIC AND MONETARY DEVELOPMENTS OF 1961-1964

Introduction

The development of the bills only policy and some of the major controversies surrounding this policy have been reviewed in the preceding two chapters. The present chapter examines the events that led to the termination of bills only and the underlying reasons for this action.

In addition, the economic problems that confronted monetary policy during the period 1961-64, as well as the Federal Reserve actions taken to meet these problems, are also reviewed in this chapter.

These two seemingly unrelated topics are essential to the principal objectives of the overall study. Along with some of the discussions in Chapters II and III they will provide the background against which the appropriateness of bills only can be evaluated.

The Abandonment of the Doctrine

Up to 1958, the criticisms of the bills only policy had been almost entirely directed against the doctrine's implications on the domestic sector of the economy. But in the latter part of 1957 the United States economy was facing serious balance of payments difficulties.

Economists could now claim another argument in the case against the bills only policy.

The international implications of the bills only doctrine can be readily perceived when one assumes that the central bank has the power to influence the term structure of interest rates. When a country experiences a balance of payments deficit, short-term capital outflows may be reduced by raising the short-term interest rate sufficiently so that foreigners acquire securities in the deficit country's money market. But if open market operations are confined to short-term securities, the deficit country may be unable to increase short-term rates if at the same time it is engaged in an expansionary domestic policy. In such a case, the central bank in order to increase domestic liquidity will buy short-term securities in the open market--an action which reduces short-term interest rates. But if the central bank were allowed to buy long-term securities instead of short-term alone, both the international and domestic objectives could be pursued simultaneously. Instead of buying short-term securities, the Federal Reserve could rely on purchases of long-term securities when liquidity increases are desired. This should have a depressing effect on long-term interest rates with a minimum of downward pressure on short-term rates. Lower long-term rates, according to economic theory, should be expected to act as a stimulant to domestic investment. The minimum downward pressure on short-term rates, on the other hand, will offer a minimum of encouragement to short-term capital outflows. Thus, on

the basis of this reasoning, the bills only policy was viewed by some[1] as an impediment to economic stabilization at both the domestic and the international fronts.

In addition to the balance of payments problems, the year 1958 was one in which there was a rather severe recession in the American economy. Again, the Federal Reserve policies were criticized--mostly for their failure to bring about a reduction in the long-term rate.

In March, 1959, the Joint Economic Committee began a series of hearings on the performance of the economy since the end of the Korean War. The report of this committee was made available on January 26, 1960.[2] In it, the Joint Economic Committee took the position that the bills only policy had been a hindrance to the Federal Reserve's freedom of action and recommended that it be abandoned.[3]

Another important and widely-discussed study, which advocated abandoning the bills only policy, was the Report of the Commission on Money and Credit. Concerned with the problems of employment and adequate growth as well as with the continuing balance of payments deficit, this Commission recommended that the Federal Reserve instead of relying on the bills only policy "...should be willing, when domestic or international conditions warrant, to influence directly the structure

---

[1]See for example, Joseph Ascheim, Techniques of Monetary Control (Baltimore, 1961), pp. 81-82.

[2]United States Congress, Report of the Joint Economic Committee, Employment, Growth, and Price Levels, Eighty-sixth Congress, Second Session, Report No. 1043 (Washington, 1960).

[3]Ibid., p. 34.

as well as the level of interest rates in pursuit of countercyclical monetary policies and should deal in securities of varied maturities."[4]

On February 7, 1961, the Federal Open Market Committee issued a directive to the effect that the Federal Reserve Bank of New York was authorized "...to acquire for the System Open Market Account intermediate--and/or longer-term U. S. Government securities having maturities up to 10 years, or to change the holdings of such securities, in an amount not to exceed $500 million."[5] Furthermore, this directive, according to the 1961 Report of the Board of Governors, included provisions for "swapping" operations.

> Within the terms of the /February 7, 1961/ policy directive it was possible, for example, that short-term interest rate considerations might suggest the sale of short-term securities at a time when the System did not want to absorb reserves. In such a circumstance, it might be expedient to buy longer-term securities simultaneously with the sale of shorter-term securities or to make offsetting transactions within an interval of a few days.[6]

Although the Federal Open Market Committee's action constituted a departure from the bills only policy, it was taken rather cautiously and more or less on an experimental basis in order to determine:[7]
(a) whether it would be feasible to provide bank reserves without

---

[4]Report of the Commission on Money and Credit, Money and Credit (Englewood Cliffs, N. J., 1961), p. 64.

[5]Board of Governors of the Federal Reserve System, Forty-eighth Annual Report (1961), p. 39.

[6]Ibid., pp. 41-42.

[7]Ibid., pp. 40-41.

exerting downward pressure on short-term interest rates; (b) whether the purchase of long-term securities would have a moderating influence on long-term interest rates and thus promote more investment in long-term projects; and (c) whether the criticisms of the System's policy of operating exclusively in short-term securities were warranted. It was understood that the authorization to buy long-term securities contained in the directive of February 7, 1961, was only a special authorization subject to review and reaffirmation in subsequent Federal Open Market Committee meetings. But in the final Committee meeting of that year--on December 19, 1961--the Federal Open Market Committee decided to discontinue from its directive all statements prohibiting open market transactions in longer-term securities and, instead, to give continuing authority to the Federal Reserve Bank of New York to buy and sell intermediate- and longer-term securities under the terms of the February 7 directive.[8] Thus, the era of bills only was formally terminated on December 19, 1961.

Economic Conditions, Economic Problems, and Monetary Policy: 1961-64

When the year 1961 began, the United States economy was and had been experiencing a recession for nearly eight months.[9] The trough of

---

[8]Ibid., pp. 93-94.

[9]The following sources of information have been used in this part: Board of Governors of the Federal Reserve System, Annual Report for the years 1961-1964; Federal Reserve Bank of New York, Annual Report for the years 1961-1964; and U. S. Department of Commerce, Survey of Current Business, various issues.

this recession was reached in February, 1961, when the index of industrial production stood at 102.1 (based on 1957-59 = 100) or eight percentage points below its January, 1960 peak. By early spring, 1961, economic indicators pointed toward recovery.

In terms of severity, the 1960-61 recession proved to be the mildest the American economy had experienced since the end of World War II. The only significant drop in GNP occurred in the first quarter of 1961. The GNP was then $501 billion, about $5 billion less than the peak reached in the second quarter of 1960. By the end of 1961, however, the GNP had risen to $542 billion. Other economic indicators had also registered gains in 1961. The index of industrial production rose from 102.1 in February to 109.8 in December. For the first time in the history of the United States, the per capita disposable income passed the $2,000 mark, increasing from $1,940 in the first quarter to $2,032 in the fourth.

An unexpected characteristic of the 1961 recovery was the high degree of price stability in view of the substantial increase in economic activity. The consumer price index rose only 1.1 percentage points while the wholesale price index registered a slight decline.

Two serious problems persisted in 1961. Despite the rise of output after the first quarter, the unemployment rate remained close to seven percent through most of the year and only in the last two months did it begin to decline. As 1961 came to an end, the unemployment rate was still above the six percent mark. In addition, the balance of payments remained in deficit. At the end of 1961, the country's international transactions showed a $2.4 billion excess of U. S. payments

over U. S. receipts. This was considerably less than the deficit of $3.9 billion in 1960. However, the decrease in the deficit materialized mostly in the first half of 1961. In the second half, the rate of deficit was comparable with that of 1960. The gold outflow for 1961 amounted to $1.7 billion.

Monetary policy in 1961 was confronted with two major objectives. One of these was to stimulate business expansion. Toward this end, the Federal Reserve System supplied sizeable amounts of member bank reserves which, at the end of the year, resulted in an increase of total loans and investments by commercial banks of $14.6 billion.

The second objective of monetary policy was to discourage as much as possible the outflow of short-term funds in order to reduce the deficit in the balance of payments. The departure from the bills only policy in February enabled the Federal Reserve to purchase securities in the open market outside the short-term area. This provided member bank reserves with a minimum of downward pressure on short-term interest rates. In addition, on December 1, 1961, the Board of Governors of the Federal Reserve System and the directors of the Federal Deposit Insurance Corporation approved an increase, effective January 1, 1962, in the maximum interest rates allowable on time deposits under Regulation Q. The maximum rate payable by member banks on certificates having a maturity of at least six months was raised to three and one-half percent. Similarly, the rate on deposits with at least a year to maturity was increased to four percent. In the announcement of the change in Regulation Q, the Board of Governors indicated that the purpose of this action was to permit commercial banks to compete more

effectively for savings and other time deposits and to prevent funds from moving abroad in search of higher returns.

Developments in 1962

The two basic problems of 1961 persisted through 1962. Unemployment declined somewhat, but it still averaged 5.6 percent of the labor force. Similarly, the balance of payments deficit was reduced slightly in 1962, but at a level of $2.2 billion it continued to remain a problem.

Under conditions such as these, Federal Reserve policy was again caught in the dilemma of achieving domestic and international economic objectives. As in 1961, the Federal Reserve made reserves readily available to banks so that they could provide credit for economic expansion. The loans and investments of the commercial banks increased by $19 billion during 1962, a gain of 8.5 percent over the previous year. The increase in loans to business and consumers amounted to $14 billion. At the same time, there was a continuing concern that increasing liquidity to encourage domestic expansion would aggravate further the balance of payments problem. As a defense against short-term capital outflows the System continued, whenever possible, to provide bank reserves through open market purchases outside the short-term sector of the securities market. A substantial part of excess member bank reserves was also made available when, in October, 1962, the Board of Governors of the Federal Reserve System reduced the reserve requirements against time deposits from five to four percent. This action resulted in a $780 million increase in excess reserves.

The GNP during 1962 approached $555 billion, about seven percent above the previous year. Whereas, however, in the last three-quarters of 1961 the GNP increased by an average of $12 billion per quarter, the comparable figure in 1962 for all four quarters was only $6 billion. The index of industrial production at the end of 1962 stood at 119.2 (based on 1957-59 = 100) as compared with an index of 109.8 for December, 1961.

Consumer prices showed a somewhat larger increase in 1962 than in 1961. The 1.2 percentage points rise in the consumer price index was primarily due to the increase in the prices of certain agricultural products, notably meats. In 1961 food prices had declined.

Finally, 1962 was the year in which serious consideration was given to the possibility of tax reductions as a means to stimulate the economy. The persistence of substantial unemployment, along with the presence of excess capacity in industry, was looked upon as the result of insufficiency in aggregate demand. Government economists and some politicians, therefore, reasoned that the lowering of personal income tax rates and the effects of this action on disposable income offered the best prospect of reaching higher levels of employment and resource utilization.

Developments in 1963

By several measures, the performance of the United States economy in 1963 showed an improvement. Production, employment, per capita personal income, corporate profits, all these showed gains in 1963. But the familiar problems of unemployment and balance of payments disequilibrium continued to exist.

In more specific terms, the GNP continued to increase throughout 1963, climbing to $585.1 billion for the year as a whole. This represented an increase of over $30 billion or 5.5 percent from 1962. Disposable income on per capita basis for the entire year rose above the $2,100 mark.

The increased output in 1963 brought about an advance in employment. Total civilian employment averaged 68.8 million for the year, and this figure was approximately one million greater than that of 1962. The level and rate of unemployment, however, showed little change during the year. The average number of unemployed was slightly above four million, or 5.7 percent of the labor force.

The consumer price index rose by 1.3 percentage points over 1962. This was approximately the same increase that took place in each of the two previous years. On the other hand, the index of wholesale prices for all commodities declined from 100.6 percent in 1962 to 100.3 percent in 1963. This overall decline was primarily the result of the fall in wholesale prices for farm products from 97.7 to 95.7 during the same period.

An important development in 1963 was the sharp decline in the balance of payments deficit from the first to the second half of the year. At a seasonally adjusted annual rate, the deficit on regular transactions decreased from around $4.5 billion during the first six months of the year to $1.6 billion in the last six months. For the year as a whole, the adverse balance on regular transactions was $3.3 billion.

The Federal Reserve during 1963 continued to pursue policies designed to meet the needs of the expanding domestic economy and of the deficit in the balance of payments. Credit was, therefore, abundant in 1963. The loans and investments of commercial banks increased by $18.6 billion. The increased strain on the balance of payments condition during the first half of the year forced the monetary authorities to move toward a policy of somewhat less ease after mid-year. The change was signaled on July 16, 1963, when the discount rate at the New York and six other Federal Reserve Banks was raised to three and one-half percent from the three percent rate that had prevailed since the middle of 1960. At the same time, the Board of Governors raised to four percent the maximum interest rate that member banks could pay on time deposits and certificates of deposit with maturities from 91 days to one year. The effects of these actions were reflected in the reserve position of member banks. Free reserves in 1963 averaged around $200 million as compared to $424 million in 1962.

Finally, in November, 1963, the Board of Govenors in seeking to prevent excessive use of stock market credit increased the margin requirements on loans for purchasing listed securities from 50 to 70 percent of the market value of the securities.

Developments in 1964

The economic gains of 1963 were equaled and, in some cases, even surpassed during 1964. In addition, 1964 was the fourth successive year of high and rising economic activity. The expansion from the cyclical trough in February, 1961, had become by the end of 1964 one of the longest periods of advance on record.

After a rather lengthy discussion, the United States Congress early in 1964 approved a personal and corporate income tax reduction. The income tax reduction brought about an increase in disposable income and a rise in consumer spending. At the end of the year, disposable personal income had increased by $29.5 billion over 1963 while personal consumption expenditures went up $24.5 billion during the same period.

The GNP increased by an annual rate of more than $10 billion a quarter during the first three-quarters of 1964. In the fourth quarter the rate of increase was only $6 billion, but this was mainly due to labor strikes in the automobile industry which began in the final week of September. For the year as a whole, GNP was $622.5 billion, an increase of $38.5 billion, or 6.5 percent at prevailing prices, over 1963.

Price changes during 1964 were not markedly different from those experienced in the previous three years. The consumer price index advanced about 1.25 percentage points over 1963, while the wholesale price index remained virtually unchanged. A major factor contributing to the rise in the consumer price index was the increase in the prices for services.

The expansion of the economy during 1964 had, as it would be expected, favorable effects upon employment. Total employment in 1964 reached 70.4 million. The increase of 1.5 million in employment over 1963 more than kept pace with the 1964 growth in the labor force of 1.3 million. Unemployment averaged 5.2 percent of the labor force.

The reduction in the balance of payments deficit which had occurred during the second half of 1963 continued into the first quarter of 1964; thereafter the size of the deficit increased. Nevertheless, the $3 billion deficit on regular transactions in 1964 was $300 million lower than that of the previous year. The decrease during 1964 in the gold reserves amounted to $125 million. This was the smallest gold drain in seven years.

In 1964 the major objectives of monetary policy were again to provide credit for continued expansion and to reduce incentives for short-term capital to flow out of the country. To implement the first objective the Federal Reserve supplied sufficient reserves to member banks to permit an expansion in bank credit of $19.5 billion during the year. On the other hand, when toward the end of 1964 the international payments system was disturbed because of the sterling crisis, the Federal Reserve did not hesitate to take precautionary action against possible capital outflows. When the British bank rate was increased from five to seven percent on November 23, the Federal Reserve discount rates were raised from 3.5 to 4.0 percent and a simultaneous upward adjustment was made in ceilings of time deposit interest rates.

The brief year-to-year description of the state of the United States economy during the early sixties may be summarized as follows: Since the beginning of the business expansion in February, 1961, the annual rate of increase in GNP has been more than 6.5 percent in current prices and more than five percent after allowing for price increases. Some gains were also registered in the level of employment

and the size of the deficit in the balance of payments was somewhat reduced. Nevertheless, these two problems--the unemployment rate and the balance of payments deficit--continued to remain unsolved throughout the 1961-64 period. During the same period, the major objectives of monetary policy were to provide reserves for economic expansion and to discourage the outflow of capital.

Open Market Transactions, 1961-1964

Practically all changes in member bank reserves during 1961-64 were brought about through the use of open market operations. The Federal Reserve reduced reserve requirements once in the period 1961-64. This occurred in the fall of 1962 when the Board of Governors reduced the reserve requirement on time deposits from five to four percent, thereby increasing excess reserves by $780 million.

Volume of Open Market Transactions

The bills only policy, besides limiting open market operations to short-term securities, also provided for a "minimum of intervention" in the open market. Its termination, therefore, in 1961 enabled the Federal Reserve to pursue a more active open market policy for the period 1961-64 than it had pursued in earlier periods. Table I indicates how open market transactions have been conducted during the 1961-64 period.

Total Federal Reserve transactions--outright plus repurchase agreements--for this period amounted to $118.4 billion. This is a greater amount than the total of $104.4 billion of the seven-year period 1954-60.

In terms of annual averages, the 1961-64 average of $29.6 billion represents an increase of almost 100 percent over that of the 1954-60 period.

TABLE I

VOLUME OF SYSTEM TRANSACTIONS IN U. S. GOVERNMENT SECURITIES

Year or Period	Total	Outright[a]	Repurchase Agreements	Redemptions
		(Billions of Dollars)		
1954-60	104.4	39.0	65.4	9.1
1961	24.7	15.2	9.5	1.3[b]
1962	28.6	16.6	12.0	1.4
1963	31.4	13.3	18.1	1.2
1964	33.7	15.9	17.8	2.1
1961-64	118.4	61.0	57.4	6.0
Annual Average				
1954-60	14.9	5.6	9.4	1.3
1961-64	29.6	15.2	16.4	1.5

[a]Open market purchases and sales taken together.

[b]Includes $295 million of maturing coupon issues.

Source: Federal Reserve Bulletin, Vol. 50, No. 7 (July, 1964), p. 825; and Board of Governors of the Federal Reserve System, Annual Reports for the years 1961-1964.

Both outright transactions and repurchase agreements increased during the 1961-64 period. But, of the two, the greatest growth has been realized in outright transactions. The average of outright transactions for the period 1961-64 was almost three times greater than the equivalent figure of the previous seven-year period. The substantial

growth in repurchase agreements was mainly motivated by the Federal Reserve's concern to minimize fluctuations of short-term interest rates. Repurchase agreements are usually undertaken when the System wants to increase member bank reserves on a temporary basis. A similar reserve effect to that of repurchase agreements would be realized if the Federal Reserve bought bills outright and then sold them after a specified period (i.e., same period as that specified under repurchase agreements). But, outright purchases of bills may put direct downward pressure on short-term interest rates and also may reduce the inventories of the dealers below the desired levels. When this occurs, dealers cannot be certain that the System will sell soon after it buys and they may decide to increase their inventories, thereby driving the short-term rate further down. When the temporary need for reserves is over and the System decides to sell the bills it had bought earlier, the bill-rate will be driven up. However, much of the fluctuation in the bill-rate could have been avoided if repurchase agreements were used instead of outright transactions. If the System were to purchase securities from dealers under the condition that these securities would be repurchased by the same dealers within a certain period, there would be no need for any increases in dealers' inventories because the dealers would know that their securities would soon be available to satisfy customer demands. Thus, there would be less fluctuation in interest rates when repurchase agreements would be used.

Maturity Distribution of Outright Transactions

The departure from the bills only policy in early 1961 was followed by open market transactions outside the short-term sector. For the period 1961-64, purchases of securities with maturities greater than one year totaled over $7.1 billion, while sales of such securities during the same period amounted to only $255 million. The greater volume of purchases as compared to sales in this period was in accordance with the Federal Reserve's objective of providing adequate bank reserves and minimizing downward pressure on short-term interest rates at the same time.

As Table II shows, only twice in the preceding seven-year period had the Federal Reserve dealt in securities with more than a year to maturity. In 1958, the Federal Reserve intervention in the longer-term area was in response to the "disorderly conditions" of the securities market that developed in the summer of that year.[10] The other occasion was in 1960 when the Federal Reserve bought $113 million of intermediate-term securities and sold $14 million of such securities. The author has been unable to find a statement as to the reasons for the 1960 intervention outside the bill sector. It should be noted, however, that the volume of securities with maturities of more than a year involved in Federal Reserve transactions during 1958 and 1960 was quite low. During the two occasions purchases and sales were only $178 and $14 million, respectively.

---

[10]Board of Governors of the Federal Reserve System, Annual Report (1958), p. 7.

TABLE II

MATURITY DISTRIBUTION OF TOTAL OUTRIGHT TRANSACTIONS OF THE SYSTEM

Year	Treasury Bills			Coupon Issues Maturing					
				1 Year		1-5 Years		Over 5 Years	
	Purchases	Sales	Redemptions	Purchases	Sales	Purchases	Sales	Purchases	Sales
	(In Millions of Dollars)								
1954	2,903	1,354	1,978	--	--	--	--	--	--
1955	2,009	1,416	1,257	167	--	--	--	--	--
1956	3,125	2,018	888	--	--	--	--	--	--
1957	2,407	2,161	984	--	153	--	--	--	--
1958	5,489	2,633	1,590	1,200	--	10	--	55	--
1959	2,866	1,574	937	--	--	--	--	--	--
1960	4,370	2,631	1,445	202	218	113	14	--	--
Total	23,169	13,787	9,079	1,569	371	123	14	55	
1961	5,794	4,486	1,015	600	1,474[a]	1,923	97	788	--
1962	6,813	6,211	1,353	1,085	402	1,569	108	362	--
1963	7,291	4,360	1,232	56	54	844	50	609	--
1964	9,433	5,437	2,093	5	--	465	--	551	--
Total	29,331	20,494	5,693	1,746	1,930	4,801	255	2,310	

[a]Excludes $295 million of maturing issues.

Source: Federal Reserve Bulletin, Vol. 50, No. 7 (July, 1964), p. 837; and Board of Governors of the Federal Reserve System, Annual Report for the years 1961-1964.

Table III shows the maturity distribution of open market purchases and sales.

TABLE III

MATURITY DISTRIBUTION OF SYSTEM PURCHASES AND SALES

Transaction by Maturity	1954-60	1961	1962	1963	1964	1961-64
			(Percent)			
Total Purchases	100.0[a]	100.0	100.0	100.0	100.0	100.0
Treasury bills	93.0	63.6	69.3	82.9	90.2	76.8
Coupon issues maturing						
1 year	6.3	6.6	11.0	.6	--	4.8
1-5 years	.5	21.1	16.0	9.6	4.4	12.6
Over 5 years	.2	8.7	3.7	6.9	5.3	6.0
Total Sales	100.0	100.0	100.0	100.0	100.0	100.0
Treasury bills	97.3	74.1	92.4	97.7	100.0	90.5
Coupon issues maturing						
1 year	2.6	24.3	6.0	1.2	--	8.5
1-5 years	.1	1.6	1.6	1.1	--	1.1
Over 5 years	--	--	--	--	--	--

[a]Detailed percentages may not always add to 100 percent because of rounding.

It can be seen from this table that the overwhelming majority of Federal Reserve purchases for the period 1954-60 as a whole were Treasury bills; 93 percent of such purchases were in bills. In contrast, during the 1961-64 period, this percentage had dropped to 76.8 percent. The percent of System purchases of intermediate- and long-term securities for the years 1961-64 was 18.6. The largest proportion of purchases in this area took place during 1961. Almost 30

percent of all the purchases during that year were maturing in more than a year. In comparison, considerably less than one percent of the purchases during the 1954-60 period were in the longer-term area.

Federal Reserve sales for both periods were concentrated in Treasury bills. For the period 1961-64, bills accounted for 90.5 percent of open market sales as compared to 97.3 percent for the preceding seven years. The somewhat lower percentage for the years 1961-64 results from the 1961 sale of $1,474 million coupon issues maturing within one year; otherwise the percent of bill sales for both periods would have been about the same. Security sales in the intermediate sector of the market were small, constituting only 1.1 percent of sales during 1961-64. During the same period, no sales were undertaken in the maturity range of five years or more. Thus, the fundamental difference in the maturity distributions of open market purchases and open market sales during this four-year period can be found in the fact that, in terms of volume, the purchases of intermediate- and long-term securities were greater than sales. This was in line with the Federal Reserve objective of providing ample bank reserves while, at the same time, keeping the long-term interest rate from rising and the short-term rate from falling.

Some Unsettled Issues

The remainder of the chapter sets the stage for an enumeration of certain issues connected with recent open market policies. It was indicated in Chapter II that the most important reason for the confinement of open market operations to bills only was the argument that

such confinement would improve the technical functioning of the securities market in terms of depth, breadth, and resiliency. Federal Reserve officials (e.g., Winfield Riefler) also presented this argument in a negative way. They argued that the extension of open market operations to the long-term sector of the market could result in mistaken expectations on the part of security dealers, thereby jeopardizing the stability of interest rates in the Government securities market. The Federal Reserve Bank of New York, on the other hand, maintained that factors other than Federal Reserve actions in the open market determine the depth, breadth, and resiliency of the securities market. Since open market operations were, in fact, extended to long-term securities, it appears possible to examine whether the views of the Federal Reserve officials regarding the technical functioning of the market were warranted.

Another issue which needs further investigation is the question of substitutability among securities of various maturities. The Federal Reserve's view on this point is that short- and long-term securities can generally be treated as near-perfect substitutes. This is based on the assumption that the forces of speculation and arbitrage will transmit yield changes which are initiated in one particular sector to other sectors of the securities market. In Chapter III several views are presented claiming that arbitrage and speculation are not capable of transmitting yield changes from one sector to another. Thus, whether the actual behavior of interest rates in securities with different maturities corresponds with the Federal Reserve's views is an hypothesis which can be verified empirically.

Finally, it is also of importance to know whether monetary policy succeeded, during the 1961-64 period, in raising short-term rates and thus reducing the difference between the yields of short-term issues and the yields of longer-term securities.

These questions will be subjected to an evaluation in the following three chapters.

CHAPTER V

THE ISSUE OF PARALLEL YIELD CHANGES

Introduction

It was generally argued by the advocates of bills only that yield changes in the short-term sector of the Government securities market would be followed by similar rapid changes in other sectors. The report of the ad hoc subcommittee, as was indicated in Chapter II, relied upon this argument to defend the proposition that longer-term yields could be controlled by actions that affect short-term yields. Riefler's analysis in 1958 also assumed or argued that long-term yields would respond to changes of short-term yields. He wrote that, although "...open market operations have been confined almost wholly to Treasury bills, the response to those operations in the long-term capital markets and in movements of long-term interest rates has been in general anything but lethargic."[1]

Both the ad hoc subcommittee report and the Riefler analysis emphasize that the forces behind the transfer of yield movements from one sector of the market to another are arbitrage, speculation, and the substitution of security instruments of various maturities that is

---

[1] Winfield W. Riefler, "Open Market Operations in Long-Term Securities," Federal Reserve Bulletin, Vol. 44, No. 11 (November, 1958), p. 1260.

undertaken by insurance companies and other financial institutions when there are opportunities for higher returns.

Under conditions such as these it would be possible to bring about changes in long-term rates simply by changing short-term rates. The opposite is, by implication, also true. Should there be a change in long-term yields, the forces of arbitrage, speculation, and substitution would bring about a change of the same direction in short-term yields. Furthermore, such analysis implies that as long as yield movements are transferred from one sector to another any attempts by monetary authorities to bring about a lasting change in the relationship between the levels of short- and long-term yields will fail. If, for example, the System through open market purchases lowered long-term yields relative to short-term yields, this situation cannot be maintained because the transfer of funds from the long- to the short-term sector will lower short-term yields and raise long-term yields so that the net effect of the original change in long-term yields will be to leave both short- and long-term yields lower than they were at the time the open market purchases took place.

There are important policy implications in such analysis. During the 1961-64 period, as was indicated in the preceding chapter, one of the main Federal Reserve objectives was to raise short-term interest rates in relation to long-term. Under the assumption, however, that yield movements are easily transferred from one sector to another the attainment of such an objective would have been impossible because increases in short-term rates would have been followed by similar increases in long-term rates, and all that monetary policy would have

been able to achieve would be to raise the levels of both the short- and long-term rates. Thus, the attainment through monetary policy of higher short-term rates relative to long-term would seem to depend upon the ineffectiveness of arbitrage, speculation, and substitution to transfer yield movements from one market sector to another.

The present chapter will be devoted to testing the hypothesis that yield changes in one sector are followed by similar changes in other maturity sectors.

Methods of Testing the Hypothesis

The hypothesis can be tested in at least two different ways. One of these is to observe yield changes for a given time period in a particular maturity sector and determine whether the yields of another sector during the same time period have changed in the same direction. Under the assumption that the securities market is characterized by arbitrage, speculation, and substitution it should be expected that yield changes in two different maturities sectors will be in the same direction. If, for example, short-term yields during a given week declined, long-term yields, also, should have declined during the same week. Such expectation also depends upon how quickly yield changes in the short-term sector are transferred to the long-term sector. In general, the proponents of bills only thought that the yield movements from one sector to another are brought about without much delay. During the 1954 ad hoc subcommittee hearings, for instance, Chairman Martin, in response to a question by Senator Flanders on the subject of arbitrage, gave the following answer: "Well, I think the process of

arbitrage, which is the adjustment which Mr. Sproul thinks has more of a lag than I think it has, takes place very quickly in the market for Government securities."[2]

The other method that can be used to determine whether yield movements are transferred from one sector to another utilizes correlation analysis. It is based on the proposition that the size of the correlation coefficient (r) or the coefficient of determination (r^2) between the yields of two debt instruments of different maturities can serve as an indicator as to the degree of exactness by which yield movements in the two instruments parallel each other. If, for example, yield changes in the short-term sector are followed by the same percentage changes in the long-term sector, i.e., if the bill rate during a certain period doubles the bond rate also doubles, then the correlation coefficient as well as the coefficient of determination for short- and long-term yields would have maximum values, that is, both would have a value equal to unity. On the other hand, should the yield movements in the long-term sector be independent of the movements in the short-term sector the correlation coefficient would be only a small fraction of one and this would indicate that the forces of arbitrage, speculation, and substitution are not very effective in transmitting yield changes from the short- to the long-term sector of the market.

---

[2]United States Congress, Joint Committee on the Economic Report, Subcommittee on Economic Stabilization, United States Monetary Policy: Recent Thinking and Experience, Hearings, Eighty-third Congress, Second Session (Washington, 1954), p. 230.

The Evidence from Weekly Yield Changes

To determine the extent by which yield movements in two different maturity sectors parallel each other, different yields for the period 1956-64 have been observed and their changes recorded. All yields are weekly averages. They are shown in Appendix Table I.

Table IV summarizes the direction of yield changes on Treasury bills and long-term bonds for the years 1956-64.

The first column shows the number of weeks that the yields on Treasury bills and long-term bonds changed in the same direction. That is, either both yields increased during a given week or both yields decreased. In the same way, if one of the two yields increased while the other decreased then such change is registered under the column "changed in opposite direction." Weeks in which only one of the two yields changed or neither of the two rates changed are recorded in the last two columns.

As Table IV indicates, during the period 1956-60 the number of weeks that the yields of bills and bonds moved in the same direction varied from 26 weeks per year to 36 weeks per year. In percentage terms such changes varied from around 51 percent to about 68 percent. For the period 1956-60 as a whole, 151 weekly changes were in the same direction, 75 in the opposite direction, and for 34 weeks there was either no yield change from the preceding week or only one of the two yields changed. In terms of percentages, yields on bills and bonds moved in the same direction in 58.08 percent of the weeks during this period and in 28.85 percent of the weeks they moved in opposite directions.

TABLE IV

DIRECTIONS OF WEEKLY YIELD CHANGES ON 91-DAY TREASURY BILLS AND LONG-TERM BONDS

Year or Period	Changed in Same Direction		Changed in Opposite Direction		Only One of the Two Changed		Neither Changed	
	Number of Weeks	Percent of Weeks	Number of Weeks	Percent of Weeks	Number of Weeks	Percent of Weeks	Number of Weeks	Percent of Weeks
1956	26	50.98	17	33.33	8	15.69	0	--
1957	30	57.69	17	32.69	4	7.70	1	1.92
1958	29	55.77	14	26.92	8	15.38	1	1.92
1959	30	57.69	16	30.77	6	11.54	0	--
1960	36	67.92	11	20.75	6	11.32	0	--
1956-60	151	58.08	75	28.85	32	12.31	2	0.77
1961	25	48.08	18	34.62	9	17.31	0	--
1962	25	48.08	15	28.85	12	23.08	0	--
1963	22	42.31	8	15.38	20	38.46	2	3.85
1964	14	27.45	7	13.73	25	49.02	5	9.80
1961-64	86	41.54	48	23.19	66	31.88	7	3.38

For the period 1961-64, yield changes in the same direction as well as yield changes in the opposite direction were less frequent than in the 1956-60 period. This difference may be partly attributed to the rise in the percent of weeks that only one of the two rates changed. For 1956-60 this percentage was 12.31, in contrast to 31.88 for the period 1961-64.

For the period 1956-64 as a whole, yields moved in the same direction 237 times and 123 times in the opposite direction. It may be said, therefore, that for every three weekly changes in the yields of both, bills and long-term bonds, about two such changes were in the same direction and one in the opposite. Such behavior is certainly not consistent with the assumption that the forces of arbitrage, speculation, and substitution will cause parallel yield changes from one sector to another. Contrary to such an assumption, for the period 1956-64 one-third of the weekly changes were in the opposite direction. The validity of this assumption is further weakened when the weeks in which only one of the yields changed are considered as evidence against the hypothesis. Such interpretation can be based on the argument that if one of the two rates changed, arbitrage and speculation should have transmitted a similar change to the other sector. Then for the period 1956-64, the total of the weeks in which either changes in the opposite direction occurred or only one of the two yields changed comes to 221 (See Table IV). This is only slightly less than the total of 237 weeks in which the two yields changed in the same direction.

In addition to Treasury bills and long-term bonds, the yield behavior of another combination of maturities has, also, been analyzed.

This combination includes the yields of 3-5 year issues and long-term bonds. The results are shown in Table V.

The yield movements in this combination differ from the yield movements of bills and long-term bonds in one important respect. During both the 1956-60 and 1961-64 periods, the yields on 3-5 year issues and long-term bonds changed more often in the same direction and less frequently in the opposite direction than did the yields of bills and bonds. The ratio of the number of weeks that yields of 3-5 year issues and long-term bonds moved in the same direction to the number of weeks that these yields moved in the opposite direction is 5 to 1 for the 1956-60 period and 6.63 to 1 for 1961-64. In comparison, the corresponding ratios for bills and long-term bonds were 2 to 1 for both the 1956-60 and 1961-64 periods. Even when the number of weeks in which the yields on 3-5 year issues and long-term bonds changed in the opposite direction are added to the weeks that only one of these two yields changed, the total is less than the number of weeks that witnessed yield changes in the same direction. For the period 1956-64, as a whole, the number of weeks with opposite yield changes plus the number of weeks with only one of the two yields changing comes to a total of 146 as compared with a total of 311 yield changes in the same direction. In contrast, the corresponding figures for bill-bond yield changes were 237 in the same direction and 221 either in the opposite direction or change in one only. The empirical evidence leads to the

TABLE V

DIRECTIONS OF WEEKLY YIELD CHANGES ON 3-5 YEAR ISSUES AND LONG-TERM BONDS

Year or Period	Changed in Same Direction		Changed in Opposite Direction		Only One of the Two Changed		Neither Changed	
	Number of Weeks	Percent of Weeks	Number of Weeks	Percent of Weeks	Number of Weeks	Percent of Weeks	Number of Weeks	Percent of Weeks
1956	36	70.59	5	9.80	10	19.61	0	--
1957	39	75.00	8	15.38	4	7.70	1	1.92
1958	34	65.38	9	17.31	8	15.38	1	1.92
1959	38	73.08	7	13.46	7	13.46	0	--
1960	38	71.70	8	15.09	6	11.32	1	1.89
1956-60	185	71.15	37	14.23	35	13.46	3	1.15
1961	37	71.15	5	9.62	9	17.31	1	1.92
1962	35	67.31	8	15.38	9	17.31	0	--
1963	29	55.58	2	3.85	18	34.62	3	5.77
1964	25	49.02	4	7.84	19	37.25	3	5.88
1961-64	126	60.87	19	9.18	55	26.57	7	3.38

conclusion that the extent to which yield changes move in the same direction depends upon the combination of the two maturity issues.[3]

This analysis of yield movements on 3-5 year issues and long-term bonds indicates that the extent of parallel yield changes within these two maturity classes is much greater than between Treasury bills and long-term bonds. Although this evidence is not entirely consistent

---

[3]The question of whether the direction of yield changes is independent of the particular combination of maturities can be subjected to statistical test. The yield changes in the same direction and the opposite direction for the period 1956-64, as a whole, can, along with the two different maturity combinations, form the following contingency table:

Maturity Combination	Number of Weeks Yields Changed in Same Direction	Number of Weeks Yields Changed in Opposite Direction	Total
Bills and Bonds	237	123	360
3-5 Years and Bonds	311	56	367
Total	548	179	727

The Chi-square statistic can be used to test the hypothesis that the two characteristics (direction of yield change and maturity combination) are independent. For the above table the value of the Chi-square statistic is:

$$x^2 = \frac{[|(237)(56) - (123)(311)| - 1/2(727)]^2}{(360)(548)(179)(367)} = 33.8$$

For one degree of freedom, the theoretical $x^2_{.995}$, that is, when $\alpha = .005$, is 7.88. The hypothesis of independence in the two traits must be rejected, i.e., there is sufficient evidence to believe that the direction of yield changes depends upon or is influenced by the maturity combination.

with the arbitrage-speculation-substitution hypothesis, it, nevertheless, suggests that if arbitrage, speculation, and substitution are the forces which transmit yield movements from one sector to another then these forces must be more effective in transferring yields between the intermediate- and the long-term sectors of the market than between the short- and long-term sectors.

The Evidence from Correlation Analysis

A number of simple correlation coefficients have been computed using yields of different maturities as variables. This method of determining the responsiveness of yield changes in a certain sector to the yield changes of another sector has the advantage over the method of simply observing and analyzing yield changes between sectors, in that it takes into account the magnitude of changes. For example, if the yields on bills and bonds both increased during a certain week, under the method of simply analyzing this change, the conclusion would be the same, no matter if the change in the bond yield was three times greater than the change in the bill yield. In correlation analysis, however, the magnitude of such changes will affect the value of r and, therefore, the conclusions that are derived from it.

The variables which have been used in deriving the correlation coefficients are weekly yields on 91-day Treasury bills, 9-12 month Treasury bills, 3-5 year note and bond issues, and long-term bonds maturing or callable in 10 years or more. Correlation coefficients for three different time periods have been computed. The time periods

selected are 1956-64, 1956-60, and 1961-64. The values[4] of the correlation coefficients are shown in Table VI.

The values of the correlation coefficients depend upon the maturities of the independent and dependent variables. For clarity of analysis, these correlation coefficients will be examined in three separate categories.

Yields on 91-Day Bills as the Independent Variable

The values of the correlation coefficients resulting from the use of yields on 91-day bills as the independent variable--with one

---

[4]The observed values of r have been tested for significance by the t statistic:

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r}} \quad \text{where } n = \text{sample size.}$$

The smallest sample size in this study is that of 203 weeks for the period 1961-64. The theoretical t-value with 201 degrees of freedom at the .01 level of significance is 2.576. Substituting this value in the above formula and solving for r it is found that:

$$2.576 = \frac{r\sqrt{203-2}}{\sqrt{1-r}}$$

$$r = \pm .18$$

Thus, any r with an absolute value greater than .18 is significant, i.e., the population correlation coefficient is not equal to zero. It should be noted, however, that one of the required assumptions for tests of significance is that the samples were taken by a random method. The samples for the periods 1956-60 and 1961-64 were selected on the basis of their relevance to the present study. No random process was used for selecting the data. Thus, the assumption of random sampling may have been violated.

TABLE VI

SIMPLE CORRELATION COEFFICIENTS AMONG SECURITY YIELDS OF DIFFERENT MATURITIES

Independent Variables	Dependent Variables: 9-12 Month Issues 1956-64	9-12 Month Issues 1956-60	9-12 Month Issues 1961-64	3-5 Year Issues 1956-64	3-5 Year Issues 1956-60	3-5 Year Issues 1961-64	Long-Term Bonds 1956-64	Long-Term Bonds 1956-60	Long-Term Bonds 1961-64
91-Day Bills	.9340	.9533	.9166	.8290	.8536	.7188	.5409	.5453	.7721
9-12 Month Issues				.9352	.9515	.8595	.6267	.7147	.8737
3-5 Year Issues							.8068	.8698	.8988

exception--have a tendency to become smaller and smaller as the maturity of the dependent variable increases. The exception is the correlation coefficient between the yields of bills and long-term bonds for the period 1961-64. This coefficient has a value of .7721 which is greater than the value of the correlation coefficient of the same period between yields on bills and 3-5 year issues.

The correlation coefficients between yields on 3-month bills and 9-12 month Treasury bills varied from .9166 to .9533. There can hardly be any doubt that correlation coefficients such as these indicate a high degree of association between the two variables. The .9340 correlation coefficient, for example, for the 1956-64 period indicates that the coefficient of determination (r^2) has a value of .8727; that is, 87.27 percent of the variation in the yields of 9-12 month issues can be explained by the variation in the yields of 91-day bills. Such evidence, of course, implies that yield changes in the 91-day bill sector are closely followed by similar changes in the 9-12 month bill sector.

The correlation coefficients between the yields of 91-day bills and the yields of 3-5 year issues, except for the coefficient of 1961-64, suggest a definite relationship although the degree of association is less precise than in the previous case. For the periods 1956-64 and 1956-60, approximately 70 percent of the variation in 3-5 year yields is explainable by the variation in bill rates. For the period 1961-64, the coefficient of determination is only 50 percent, thus suggesting a rather poor relationship between the two variables.

The coefficients of correlation between 3-month bills and long-term bonds for 1956-64 and 1956-60 suggest that less than one-third of the variation in bond yields for the two periods was associated with changes in 3-month yields. The somewhat higher correlation coefficient for the period 1961-64 can be partly explained by the fact that long-term yields during this period, as it will be shown in the next chapter, remained relatively stable. Even so, a correlation coefficient of .7721 would indicate that some 40 percent of the variation in bond yields was not associated with changes in bill yields.[5]

Yields on 9-12 Month Issues as the Independent Variable

The values of the correlation coefficients between the yields on 9-12 month issues and 3-5 year issues for all three time periods indicate that there is indeed a great deal of association between the two variables. In every time period the size of the correlation coefficient was greater than the case where the 91-day bill yields were used as independent variable (see Table VI).

The correlation coefficients between the yields of 9-12 month issues and long-term bonds also increased over those with 91-day bill yields as the independent variable. But, except for the 1961-64 period, these correlation coefficients do not suggest a great degree

---

[5]In contrast with correlation coefficients obtained from weekly data, a correlation coefficient of .7901 has been reported between monthly yields on 3-month bills and long-term bonds for the period 1951-59. See Daniel S. Ahearn, Federal Reserve Policy Reappraised, 1951-1959 (New York, 1963), p. 87.

of parallel yield changes in 9-12 month issues and long-term bonds. The .8737 correlation coefficient for the period 1961-64 can again be attributed to the relative stability of long-term yields during this period.

Yields on 3-5 Year Issues as the Independent Variable

Although the correlation coefficients between yields on 3-5 year issues and long-term bonds is not unity, the values of these coefficients indicate that a large part of the variation in long-term yields is associated with changes in yields on 3-5 year issues. With correlation coefficients ranging from .8068 to .8988, approximately 65 to 80 percent of the variation on bonds can be attributed to the variation in the yields of 3-5 year issues.

It may, therefore, be concluded that of the three independent variables used, it is the yields on 3-5 year issues whose movements are most closely associated with those on long-term bonds.

Relationship Among Yields in Percentage Terms

Table VII contains a series of correlation coefficients which have been computed after the data on yields were converted into logarithms. The transformation of data was undertaken in order to consider the relationship between percentage changes rather than absolute changes.

In general, the r values obtained from the converted data are similar to those obtained from the original data as shown in Table VI. Therefore, the conclusions reached in the previous sections are not altered.

TABLE VII

SIMPLE CORRELATION COEFFICIENTS AMONG SECURITY YIELDS WITH DATA CONVERTED INTO LOGARITHMS

Independent Variables	Dependent Variables: 9-12 Month Issues			3-5 Year Issues			Long-Term Bonds		
	1956-64	1956-60	1961-64	1956-64	1956-60	1961-64	1956-64	1956-60	1961-64
91-Day Bills	.9512	.9635	.9076	.8210	.8332	.6877	.4997	.4657	.7803
9-12 Month Issues				.9163	.9254	.8458	.5906	.6218	.8736
3-5 Year Issues							.7992	.8393	.8854

Correlation of the First Differences

There is still another approach to the question of parallel yield changes in the various maturity sectors. This approach examines the relationship between the weekly differences in the yields of one maturity issue and the weekly yield differences in other maturity issues. To establish the extent by which yield differences from week-to-week in a given issue are associated with the corresponding differences in another issue, the first differences in the weekly series of yields for the four different maturity classes have been correlated. The first difference for any maturity class is defined as follows:

$$d_t = y_t - y_{t-1}$$

where:

d_t = the difference in yield for a given maturity issue;

y_t = the actual yield for week t; and

y_{t-1} = the actual yield for the week preceding week t.

The results of the correlation are shown in Table VIII. The values of the correlation coefficients suggest that there is little association among the first differences in yields. The values of these coefficients vary from .7142 to .1165. At best, therefore, only about one-half of the variation in the first differences of the dependent variable can be attributed to the first differences of the independent variable. At worst, the amount of the explained variation is 1.23 percent.

Under the assumption that arbitrage and speculation transfer yield changes from one maturity sector to another, it would be expected that

TABLE VIII

SIMPLE CORRELATION COEFFICIENTS AMONG FIRST-DIFFERENCES IN YIELDS OF VARIOUS MATURITY ISSUES

Independent Variables	Dependent Variables: 9-12 Month Issues			3-5 Year Issues			Long-Term Bonds		
	1956-64	1956-60	1961-64	1956-64	1956-60	1961-64	1956-64	1956-60	1961-64
91-Day Bills	.6907	.7099	.5264	.3640	.5454	.1165	.2377	.2382	.2382
9-12 Month Issues				.4845	.7142	.1918	.2832	.2790	.3386
3-5 Year Issues							.3112	.4157	.2519

the first differences are closely associated. This, however, is not the case as the evidence of low correlation in these differences shows.

Multiple Regression

In addition to simple correlations, multiple regression has been used--mainly to study the relationship between long-term bond yields as the dependent variable and the other three yields as the independent variables.

The regression model which has been used is of the form:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3$$

where:

y = yield for long-term bonds;

x_1 = yield for 3-month Treasury bills;

x_2 = yield for 9-12 month issues; and

x_3 = yield for 3-5 year issues.

Two different regression equations have been computed--one using data for the period 1956-60 and another for the period 1961-64. Data are again averages of weekly yields. The regression equations and multiple correlation and determination coefficients are as follows:

Period 1956-60:

$$y = 1.1032 - .2530x_1 - .2310x_2 + 1.1002x_3$$

$$R = .9512 \qquad R^2 = .9048$$

Period 1961-64:

$$y = 2.5672 + .0630x_1 + .0038x_2 + .33123x_3$$

$$R = .9182 \qquad R^2 = .8431$$

The regression coefficients (b_i's) in the above equation are the actual values; that is, they have not been standardized. Their standardized values[6] are as follows:

1956-60 equation:

$t_1 = -12.0$

$t_2 = -22.9$

$t_3 = 142.9$

1961-64 equation:

$t_1 = 319.3$

$t_2 = 11.3$

$t_3 = 1214.0$

For both, the 1956-60 and 1961-64 equations, the standardized regression coefficient with the greatest value is the one for the 3-5 year

---

[6]The standardized values (t_i's) are the actual values (b_i's) divided by their standard errors (S_{bi}'s). The standard error of the i regression coefficient is:

$$S_{bi} = S_y \sqrt{C_{ii}}$$

where:

$$S_y = \sqrt{\frac{\Sigma(Y - \hat{Y})^2}{n - k - 1}}$$

C_{ii} = the inverse matrix element for b_i.

The values for S_y and C_{ii} are as follows:

1956-60 equation:

$S_y = 2.1344$
$C_{11} = .00009765$
$C_{22} = .00002222$
$C_{33} = .00001324$

1961-64 equation:

$S_y = .0480$
$C_{11} = .00001693$
$C_{22} = .00004954$
$C_{33} = .00001693$

yields (t_3). This suggests that the most important of the independent variables in the regression equation is 3-5 year yields (x_3).[7]

The multiple determination coefficient (R^2) indicates that 90.48 percent of the variation in long-term yields for the period 1956-60 is associated with the yield changes in the other three independent variables. The highest correlation coefficient for the period 1956-60 having long-term yields as dependent variable was obtained from the correlation of long-term yields as a function of 3-5 year yields. The value of this coefficient was .8068 (see Table VI) which means that the use of the two additional independent variables in multiple regression increased the explained variation of long-term yields by about 16 percent.

For the period 1961-64 the value of the multiple correlation coefficient (R) was only slightly greater than the value of the simple correlation coefficient between yields on 3-5 year issues and long-term bonds. Thus, the use of the multiple regression produced only about a four percent increase in the explained variation of long-term yields.

Lags in the Variables

The values of the simple correlation coefficients indicated that in many cases the degree of association between two yields of different maturities was low. The lowest degree of association found was between

---

[7]Statistically, all the regression coefficients are significant at the .5 percent level of significance. The theoretical t-value for $\alpha = .005$ is 2.576. However, as in previous cases, the assumption of random sampling may have been violated.

the yields on 3-month bills and long-term bonds, where only a small percentage of the variation of bond yields was explained by the changes in bill yields. These findings give rise to the question as to whether there is a time-lapse before yield changes in bills are transmitted to the long-term sector.

Generally, the advocates of the bills only doctrine thought that yield changes in the short-term sector would permeate the longer-term sectors "very quickly." How long a time period that involved, they did not say. That is, they failed to specify in exact or even approximate terms how much time it takes before yield changes in the short-term sector reach the long-term sector.

If there is a time interval involved between yield changes in the short-term sector and the yield changes in the longer-term sectors, the presence of such an interval should be reflected in the degree of association between short-term yields and the delayed or lagged yields in the other sectors. If, for example, it takes two weeks before yield changes in 91-day bills are transmitted to the long-term yields, the value of the correlation coefficient between the yields of 91-day bills and yields of long-term bonds <u>lagged</u> for two weeks should be greater than the value of the correlation coefficient between the two variables but without any lags in the long-term yields.[8]

---

[8]More precisely, the value of the correlation coefficient obtained by correlating the series of weekly yields for the period 1956-64, using as the <u>first pair</u> of observations the yields of 91-day bills and those of long-term bonds for the first week of January, 1956, and as the second pair of observations the yields of these two variables for the second week of January, 1965, and so on until the end of the series, should be smaller--assuming a two-week lag in long-term yields--than

Table IX shows the results of correlating yields of 91-day bills with lagged yields of the other three maturity issues. The simple correlation coefficients presented in this table are for the period 1956-64. The yields of 9-12 month issues, 3-5 year issues, and long-term bonds have been lagged for a maximum of eight weeks.

TABLE IX

SIMPLE CORRELATION COEFFICIENTS BETWEEN THE YIELDS ON 91-DAY BILLS AND THE LAGGED YIELDS ON 9-12 MONTH ISSUES, 3-5 YEAR ISSUES, AND LONG-TERM BONDS FOR THE PERIOD 1956-64

Number of Weeks Lagged	Lagged Variables		
	9-12 Month Issues	3-5 Year Issues	Long-Term Bonds
0	.934	.829	.541
1	.926	.817	.534
2	.911	.803	.523
3	.890	.783	.510
4	.871	.762	.498
5	.853	.741	.485
6	.833	.719	.471
7	.811	.696	.458
8	.787	.673	.446

---

the value of the correlation coefficient obtained from the series having as first pair of observations the yield of 91-day bills for the first week of January, 1956, and the long-term yield for the third week of January, 1965. In practice, the calculation of a correlation coefficient with a two-week lag for the period 1956-64 between bill and bond yields involves the deletion from the equation the yields of 91-day bills for the last two weeks of December, 1964 and the deletion of the bond yields for the first two-weeks of January, 1956. Thus, when one considers as the beginning of the series the first week of January, 1956, it is the long-term yields that lag behind the yields of 91-day bills. But, if the beginning of the series is taken to be the last week of December, 1964, it might appear that the bill yields lag behind the long-term yields. The author takes as the beginning of the series the first week of 1956.

The values of the correlation coefficients instead of increasing, as would be expected if any actual time intervals between yield changes were involved, decreased consistently as the number of weeks by which the variable was lagged increased. This was the case for all three maturity issues. When the 9-12 month yields were lagged the value of the correlation coefficient decreased from .934 with no lag to .785 with an eight-week lag. In the case of 3-5 year issues and long-term bonds the values of the correlation coefficients declined from .829 and .541 to .673 and .446, respectively, as the lags in these two variables reached eight weeks.

Similar evidence was obtained by lagging the yields of the three longer maturity issues behind Treasury bills for the periods 1956-60 and 1961-64 (see Table X).

TABLE X

SIMPLE CORRELATION COEFFICIENTS BETWEEN THE YIELDS ON 91-DAY BILLS AND THE LAGGED YIELDS ON 9-12 MONTH ISSUES, 3-5 YEAR ISSUES AND LONG-TERM BONDS FOR THE PERIODS 1956-60 AND 1961-64

Number of Weeks Lagged	Lagged Variables					
	9-12 Month Issues		3-5 Year Issues		Long-Term Bonds	
	1956-60	1961-64	1956-60	1961-64	1956-60	1961-64
0	.953	.917	.854	.719	.545	.772
1	.943	.916	.841	.718	.539	.772
2	.925	.911	.823	.717	.529	.772
3	.901	.905	.801	.715	.515	.773
4	.879	.900	.777	.710	.502	.769
5	.856	.896	.752	.704	.488	.763

One more attempt has been made to discover whether there are any lags involved in the yields of short- and longer-term securities. In

this case, the first differences in the weekly yields of 91-day bills have been correlated with the lagged first differences in the yields of the other three maturity issues. The values of the simple correlation coefficients are shown in Table XI.

TABLE XI

SIMPLE CORRELATION COEFFICIENTS BETWEEN THE FIRST-DIFFERENCES IN YIELDS FOR 91-DAY BILLS AND THE LAGGED FIRST-DIFFERENCES IN YIELDS FOR 9-12 MONTH ISSUES, 3-5 YEAR ISSUES, AND LONG-TERM BONDS FOR THE PERIOD 1956-64

Number of Weeks Lagged	Lagged Variables		
	9-12 Month Issues	3-5 Year Issues	Long-Term Bonds
0	.691	.364	.238
2	.226	.134	.082
4	-.061	.008	.022
6	.122	.040	-.027
8	.045	.010	.005

The degree of correlation between the first differences in 91-day bills and the first differences in the other three variables is small as the values of the coefficients in the first row of Table XI show. Lagging the first differences of 9-12 month issues, 3-5 year issues, and long-term bonds behind the first differences of 91-day bills did not increase the correlation coefficients. In fact, the values of the correlation coefficients decreased as the lag in weeks increased. When the first differences of 9-12 month issues were lagged the value of the correlation coefficient decreased from .691 with no lag to .045 with an eight-week lag. Similar decreases were observed when lags were introduced in the first differences with yields of 3-5 year issues and long-term bonds (see Table XI).

In short, the statistical evidence presented does not suggest the existence of time lags in yield changes between short- and longer-term issues. Since this study did not explore relationships beyond a lag of eight weeks, the question remains as to whether a lagged relation exists beyond eight weeks. In that event, however, the question arises as to the effectiveness of a monetary policy which has to wait more than eight weeks for desired changes in long-term yields to be brought about by open market operations in short-term securities.

Summary and Conclusions

The present chapter dealt with the issue of whether yield changes originated in a particular maturity sector of the market will be followed by similar changes in other maturity sectors.

The analysis of weekly yield changes between 91-day bills and long-term bonds indicated that about 50 percent of the weeks such changes were inconsistent with the arbitrage-speculation-substitution hypothesis. Yield changes on 3-5 year issues and long-term bonds were far more consistent with the hypothesis. The conclusion was reached that if there are forces which tend to transfer yield movements then these forces are more effective when applied to yield movements between intermediate- and long-term bonds than when applied to bill and bond yields.

Correlation analysis showed that the degree of association became greater as the maturity of the dependent variable approached the maturity of the independent variable. Thus, a high degree of correlation was found to exist between the yields on 3-month bills and 9-12 month

issues. Strong evidence of correlation was found between the yields of 9-12 month issues and 3-5 year issues, and 3-5 year issues and long-term bonds.

The statistical evidence showed that very little correlation exists between yields on 3-month bills and long-term bonds. The analysis also indicated that little evidence of correlation exists for yields on 9-12 month issues and long-term bonds. Thus, the statistical evidence seems to contradict the Federal Reserve contention that yield changes in the short-term sector will be transmitted promptly to other sectors. Furthermore, the failure to find any time lags suggests that it is far from certain that changes in bill yields are the most important determinant of changes in long-term rates.

With respect to intermediate- and long-term yields, there is some evidence from the analysis of yield changes and both the simple and multiple correlation that a relationship exists between the two variables. Thus, monetary actions which affect intermediate-term yields can, also, be expected to affect long-term yields. However, the evidence of low correlation between the first differences in intermediate- and long-term rates makes it clear that the exact size of magnitude of any changes in the intermediate yields will <u>not</u> be transmitted in the long-term sector.

CHAPTER VI

OPERATION TWIST AND THE EVIDENCE FROM TIME SERIES AND YIELD CURVES

As was indicated in Chapter IV, the monetary authorities during 1961-64 adopted a policy which was directed toward raising short-term interest rates relative to long-term interest rates. In recent years, this undertaking has been referred to as the policy or operation "twist."[1] Apparently, the term twist was chosen to describe more accurately the general policy aims of twisting the term structure of interest rates by raising short-term yields and lowering, or keeping from rising, long-term yields. By so changing the term structure of interest rates, the monetary authorities hoped to reduce short-term capital outflows and to attract inflows without discouraging long-term domestic investment.

One of the purposes of the present chapter is to examine recent interest rate trends and to determine to what extent the actual behavior of short- and long-term interest rates during 1961-64 has been consistent with the goals of operation twist. Another is to determine what contributions the abandonment of the bills only policy has made

---

[1]See, for example, Harry G. Johnson, "Major Issues in Monetary and Fiscal Policies," Federal Reserve Bulletin, Vol. 50, No. 11 (November, 1964), p. 1409.

in the attainment of the Federal Reserve objectives with regards to the structure of interest rates.

Interest Rates in Recent Years

Both short- and long-term interest rates rose during the business expansion of 1961-64. Such behavior was not unusual for this period. Interest rates traditionally tend to rise during cyclical upturns. In the decade of the 1950's, interest rates fluctuated cyclically around a rising trend, thus reaching new highs in each successive cycle. In each cyclical low, interest rates were higher than in the preceding cyclical low.

Apart from the rising trend, interest rate movements during 1961-64 were different from previous experiences in many important respects. These differences are pointed out in the pages that follow.

Short-Term Interest Rates

Rates on 91-day Treasury bills showed a steady increase during 1961-64. In terms of annual averages, this increase amounted to 118 basis points--from 2.36 percent in 1961 to 3.54 in 1964 (Table XII).

Table XII also shows certain weekly rates. These rates increased from 2.35 percent for the week ending on December 31, 1960 to 3.86 for the final week of 1964. There was also a similar advance in the bill rate from the recession low of 2.11 percent which occurred in the week ending October 29, 1960. From that time to the final week of 1964 the Treasury bill yield increased 175 basis points.

TABLE XII

SELECTED RATES ON 3-MONTH TREASURY BILLS, 1961-64[a]

Year	Annual Average	Final Week	Increase from: Final Week of Previous Year	Increase from: Recession Low Week
		(Percent)		
1961	2.36	2.66	.31	.55
1962	2.77	2.89	.29	.78
1963	3.16	3.52	.63	1.41
1964	3.54	3.86	.34	1.75

[a]Market yields.

Source: Federal Reserve Bulletin, various issues.

Long-Term Interest Rates

Yields on long-term Government bonds also increased during the period 1961-64 although this increase was much smaller than the increase in yields on Treasury bills for the same period. As Table XIII shows, the average annual yield on long-term bonds rose from 3.90 percent in 1961 to 4.15 percent in 1964.

The same can be concluded by observing weekly rates. Except for 1962, year-end to year-end advances in long-term yields were small. In the final week of 1962 bond yields were .22 percent lower than a year earlier.

Long-term bond yields reached a recession low of 3.75 percent during the week ending August 6, 1960. At the final week of 1964 the bond rate stood at 4.14 percent--.39 percent higher than the recession low. In contrast, Treasury bill rates increased from their recession low to the end of 1964 by 1.75 percent.

TABLE XIII

SELECTED RATES ON LONG-TERM GOVERNMENT BONDS, 1961-64

Year	Annual Average	Final Week	Increase from: Final Week of Previous Year	Increase from: Recession Low Week
			(Percent)	
1961	3.90	4.07	.25	.32
1962	3.95	3.85	-.22	.10
1963	4.00	4.16	.31	.41
1964	4.15	4.14	.02	.39

Source: Federal Reserve Bulletin, various issues.

Short- Versus Long-Term Rates

Since 1961, the spread between yields on short- and long-term securities has received considerable attention. This interest has been prompted mainly by the balance of payments problems.

Table XIV shows the actual yields and spreads between 91-day bills and long-term bonds for the years 1961 and 1964. Observing the last two columns of this table, it can be seen that the monthly spread between the bill and bond yields during 1961 was much greater than in 1964. The 1961 monthly spread ranged from approximately two to five times greater than that of 1964. The smaller spreads during 1964 can be attributed mostly to the rise in short-term yields from 1961 to 1964. This can be deduced from the data in Table XIV. While both short- and long-term yields increased during the period 1961-64, the advance of long-term yields was smaller than the rise in the yields of Treasury bills.

Compared to the 1958-60 expansion, the spread between yields on Treasury bills and long-term bonds during 1961-64 expansion has been

TABLE XIV

COMPARISON OF MONTHLY YIELDS ON 91-DAY BILLS AND LONG-TERM BONDS FOR 1961 AND 1964

Month	91-Day Bills[a]		Long-Term Bonds[b]		Spread: Long-Term Less Bill Yield	
	1961	1964	1961	1964	1961	1964
	(Percent)		(Percent)		(Percent)	
January	2.24	3.52	3.89	4.15	1.65	.63
February	2.42	3.53	3.81	4.14	1.39	.61
March	2.39	3.54	3.78	4.18	1.39	.64
April	2.29	3.47	3.80	4.20	1.51	.73
May	2.29	3.48	3.73	4.16	1.44	.68
June	2.33	3.48	3.88	4.13	1.55	.65
July	2.24	3.46	3.90	4.13	1.66	.67
August	2.39	3.50	4.00	4.14	1.61	.64
September	2.28	3.53	4.02	4.16	1.74	.49
October	2.30	3.57	3.98	4.16	1.68	.59
November	2.48	3.64	3.98	4.12	1.50	.48
December	2.60	3.84	4.06	4.14	1.46	.30

[a]Market yields.

[b]Bonds maturing or callable in 10 years or more.

Source: Federal Reserve Bulletin, various issues.

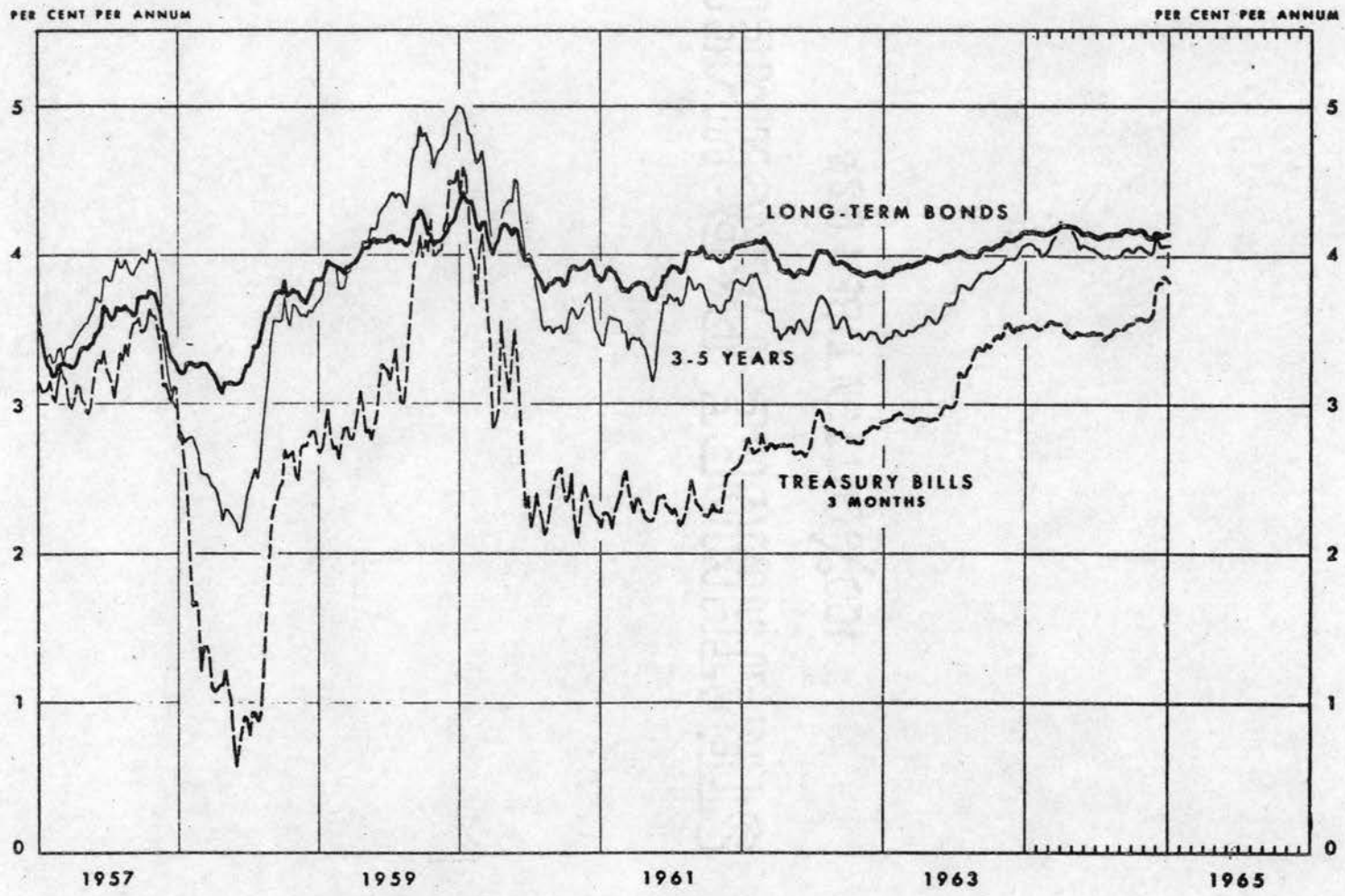
somewhat smaller. As Figure 1 shows, this spread throughout 1961-64 was around 1.5 percent. In contrast, during the middle part of 1958 the spread in yields exceeded two percent.

Figure 1 also shows another difference in the behavior of yields between the periods 1957-60 and 1961-64. During the former period, yields on Treasury bills, 3-5 year issues, and long-term bonds experienced wider fluctuations than in the period 1961-64.

Rates on short- and long-term Government securities in the recent business cycle differed from those in the two previous cycles in two respects. First, Treasury bill yields and bond yields, at their cyclical lows, remained well above the lows reached in 1954 and 1958 (Figure 2). Second, during the current expansion, both advanced less than the yields of the two earlier expansions.

Figure 2 also shows that the rates on bills during the latest cycle reached a bottom about five months before the cyclical trough and remained almost unchanged for over a year. In the two previous recessions these rates reached their lowest points very close to the time that the cyclical trough occurred (see Figure 2).

Long-term yields, on the other hand, continued their decline for almost five months after the current expansion had begun and only in the last quarter of 1961 did they rise noticeably. In the 1954 and 1958 recessions long-term rates started their climb simultaneously with the beginning of the economic expansion.

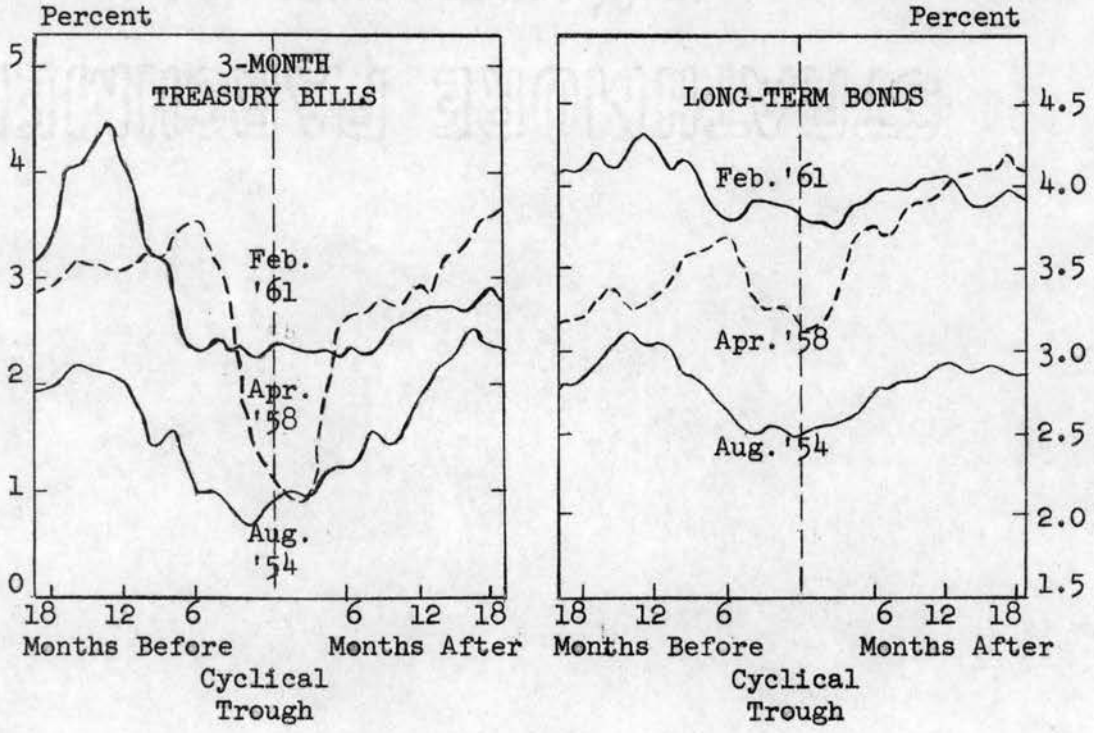


Source: Federal Reserve Chart Book (January, 1965), p. 24.

Figure 1. Yields on U. S. Government Securities, 1957-1965.

The Evidence from Yield Curves

So far, the examination of empirical evidence has been limited to time series data. Another useful source from which empirical evidence regarding the structure of interest rates may be obtained is the study of yield curves. A yield curve shows the relationship between yields and maturities at a given point in time. In graphical presentations, yields are normally measured on the vertical axis and maturities along the horizontal axis. Yields of securities with different maturities are plotted in the graph and a smooth curve is drawn through the yield plots--usually by eye.



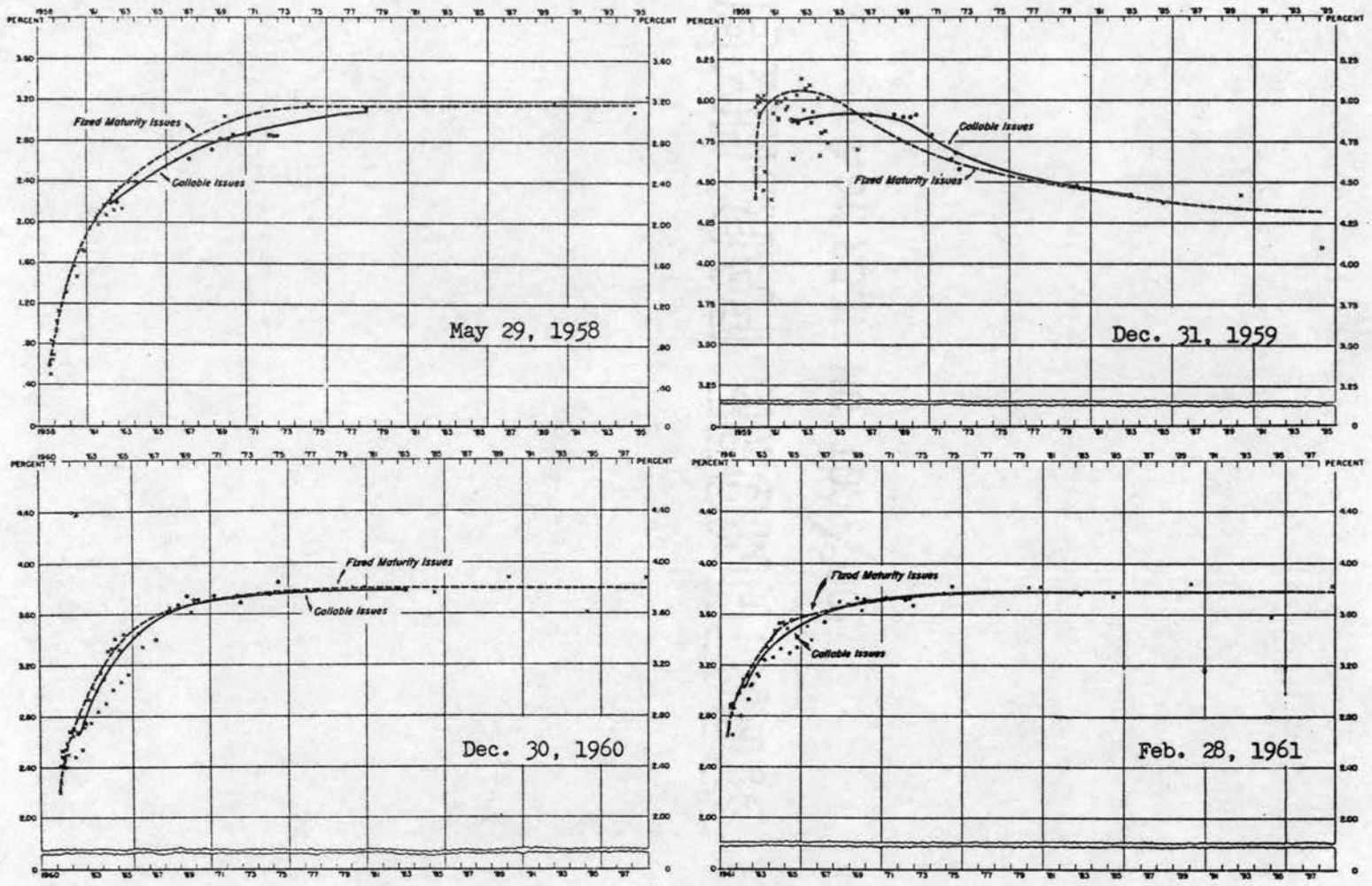
Source: Federal Reserve Bulletin, Vol. 48, No. 3 (September, 1962), pp. 1105 and 1108.

Figure 2. Yields on Short- and Long-Term U. S. Government Securities During Recent Cycles.

Yield curves for four different dates during the period 1958-60 are shown in Figure 3. The first curve, dated May 29, 1958, indicates that interest rates on short-term issues were considerably lower than those of longer-term securities. Consequently, the curve rose quite rapidly from yields of about .6 percent on 3-month issues to 1.6 percent on 1.5-year securities. Thereafter the rate of increase began to decline until maturities reached about 17 years at which point yields were approximately 3.1 percent. For securities maturing in more than 17 years the yield curve became virtually flat.

The yield curve on December 31, 1959 illustrates an entirely different yield pattern. On that date, yields on short-term securities were, as a rule, higher than the yields of longer-term issues. The yield curve, therefore, acquires a negative slope as it extends beyond the short-term area. This curve is of interest, also, because it demonstrates the general type of yield curves that operation twist was supposed to achieve. A downsweeping yield curve was thought to be desirable for both international and domestic considerations. Nevertheless, yield curves such as that of December 29, 1959 were infrequent during the period 1957-64. Only for a short period of time--towards the end of 1959 and early 1960--short-term yields, as Figure 1 on page 102 shows, stood above the bond yields. By December 30, 1960, the yield curve had moved again to an upsweeping position which was quite similar--although not as low in the shorter-term area--to that of May 29, 1958 (Figure 3).

Around the time the bills only policy was abandoned, the yield curve was still upward sloping, starting at 2.6 percent yields for



Source: U. S. Treasury Department, Office of the Secretary, Treasury Bulletin, various issues.

Figure 3. Selected Yield Curves, 1958-1961.

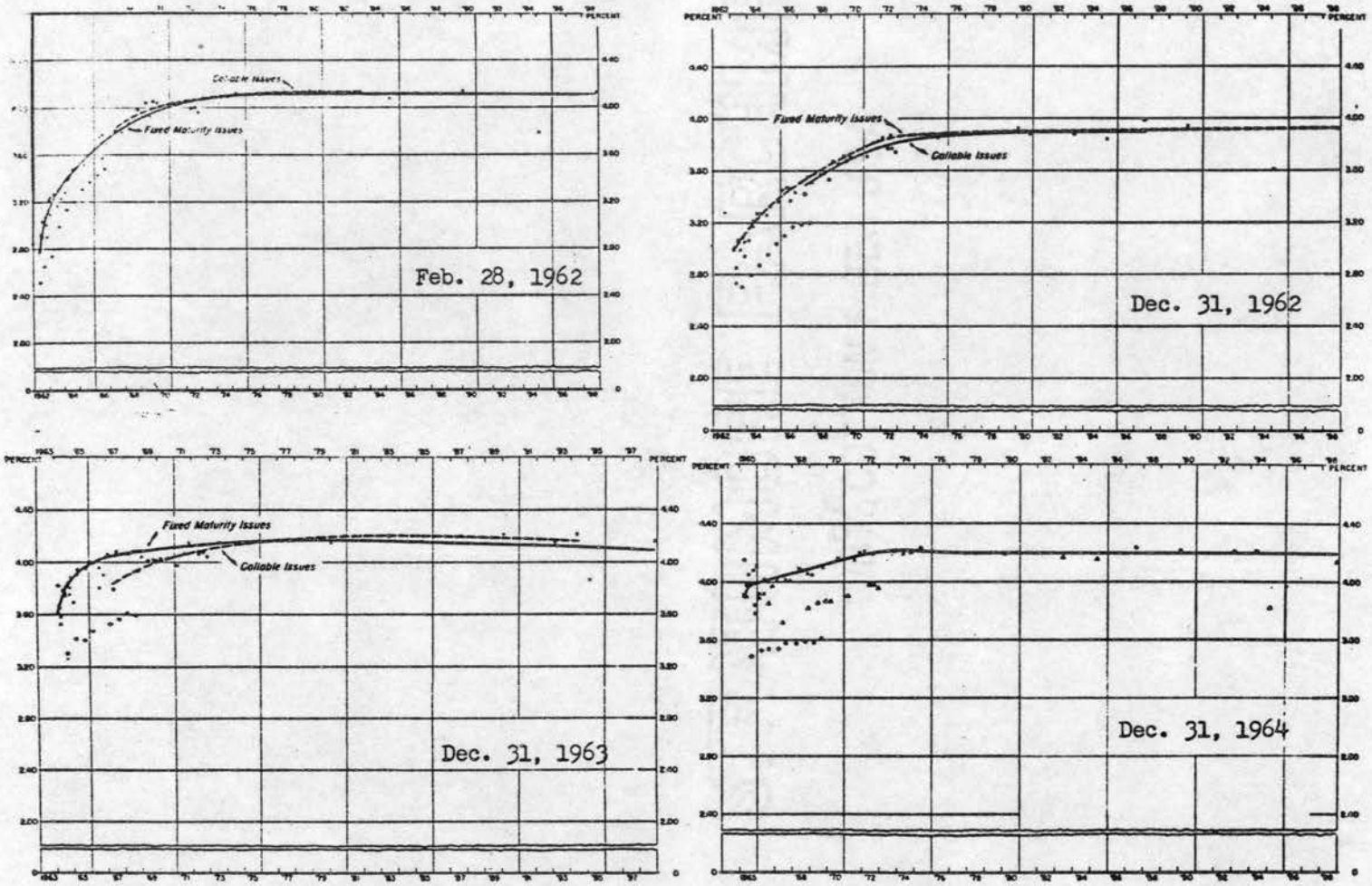
3-month maturities and rising by about 1.0 percent by the time it had reached the 5-year issues.

Figure 4 shows four more yield curves for certain dates during the period 1962-64. A year after the termination of bills only, on February 28, 1962, the general shape of the yield curve had changed very little. It simply had moved up to higher yields for every maturity level. By the end of 1962, however, the yield curve became slightly flatter. This resulted from a rise in the short- and intermediate-term yields and a fall in long-term yields.

The yield curve on December 31, 1963 has shifted further up along the short-term maturities. The long-term section of the curve had also moved up, but in comparison to the yield curve of a year earlier this advance was only about one-third as great as that of the short-term section.

Finally, the upward shift of yields in the shorter-term part of the yield curve continued into 1964. As the yield curve of December 31, 1964 in Figure 4 indicates, the long-term section was only .30 percentage points higher than the section in the short-term maturities.

Thus, in the four-year period--from February 28, 1961 to December 31, 1964--the yield curve became progressively flatter, as it shifted up at all maturity levels. But the flattening of the curve was for the most part the result of the greater upward movements in the short- and intermediate-area of the yield curve. The long-term section of the curve during the four year period moved up by something like 0.4 percentage points, whereas the short-term section advanced by about 1.2 percentage points.



Source: U. S. Treasury Department, Office of the Secretary, Treasury Bulletin, various issues.

Figure 4. Selected Yield Curves, 1962-1964.

Insofar as operation twist is concerned, the evidence from time series and yield curves demonstrates that the term structure of interest rates during 1961-64 was altered in the desired direction. That is, yields on short-term instruments did rise relative to long-term yields.

This change, however, came about mainly by the large advance in short-term yields, and not by simultaneous increases in short- and decreases in long-term rates.

The Role of Open Market Policy in Recent Interest Rate Movements

The departure from the bills only policy was to a large extent induced by the belief that such action would enable the monetary authorities to achieve certain interest rate objectives during the expansion. The question that remains to be examined is this: Has the abandonment of bills only made any positive contributions in the interest rate patterns that materialized during the period 1961-64?

Before this question is evaluated, however, it should be noted that open market operations are only one of the many factors that influence interest rate movements. In this context, other Federal Reserve actions that may have affected the actual behavior of interest rates since the 1961 upturn are the changes in discount rates, the change in the definition of legal reserves, the change in reserve requirements with respect to saving deposits, and the increases in the maximum interest rates that member banks are allowed to pay on saving deposits. These factors, being outside the scope of the present study, will not

be considered in this section and the analysis will be entirely restricted to the effects of open market operations.

The departure from the bills only policy produced two major changes in open market practices. One of these was the discontinuing of the minimum intervention principle and the other the extension of purchases and sales into longer-term securities. The significance of the first change lies in the fact that it enabled the monetary authorities to increase the volume of both outright transactions and repurchase agreements during 1961-64. As was indicated in Chapter IV, the increased use of repurchase agreements was designed to eliminate unnecessary fluctuations in short-term yields. On an a priori basis, then, one of the factors contributing to the relative stability in short-term yields since 1961 was the intensified use of repurchase agreements.

The assumption that changes in the supply of securities have an influence on the prices and yields of these securities would lead to the conclusion that open market operations outside the bill sector for the period 1961-64 had a depressing influence on long-term yields. The influence must have been depressing because open market purchases, as Chapter IV showed, of longer-term issues were greater than open market sales and, therefore, the net result of Federal Reserve intervention in longer-term securities was to reduce the supply of these issues. Thus, the extension of operations to the longer-term sector may have kept long-term yields from reaching higher levels than those that prevailed.

Purchases of intermediate- and long-term securities during 1961-64 may also have influenced the behavior of short-term yields. If the

monetary authorities had not been allowed to buy long-term securities in order to provide reserves to member banks, it is conceivable that the authorities may have done so by purchases of bills, thereby raising their prices.

Under the expectations theory of the term structure of interest rates, changes in the supplies of securities brought about by Federal Reserve actions are not expected to have any effects on security yields unless such changes cause expectations about the future course of short-term interest rates to change. J. H. Wood[2] claims that such expectations are altered when changes in the relative supplies of short- and long-term securities occur. Even if it is assumed, however, that open market operations in long-term securities do change expectations, it is not easy to establish how these operations would affect yields. Only by knowing in what direction expectations changed can the yield effects be determined. Thus, under the expectations theory, the significance of the extension of open market operations to long-term securities during 1961-64 cannot be evaluated.

Another line of explanation, but one again that is difficult to verify, is that Federal Reserve actions or announcements in connection with its objectives have direct effects upon the market's expectations. Thus, by announcing its intentions to raise short-term rates relative to long-term, the Federal Reserve may have caused people's expectations to change in a way consistent with Federal Reserve objectives.

---

[2]J. H. Wood, "Expectations, Errors, and the Term Structure of Interest Rates," The Journal of Political Economy, Vol. LXXI (April, 1963), pp. 170-171.

Furthermore, the strength of these effects would seem to depend upon the kind of instruments that the Federal Reserve is prepared to use in order to implement its objectives. In this sense, the abandonment of the minimum intervention principle and the expansion of open market operations to include long-term securities can be viewed as having enhanced the potency of the announcement effects. Looking at interest rate movements during 1961-64 from such a perspective, it can be argued that one of the ways that the abandonment of the bills only policy contributed to bringing about the change in the term structure of interest rates was through its effects on expectations.

Federal Reserve opinion also seems to recognize the effects that Federal Reserve actions have upon expectations. The following passage illustrates this point:

> The supply of short-term issues available to the public in the first 5 months of 1961 was also augmented by net sales of about $1.7 billion from the portfolios of Federal Reserve System and of Federal agencies and trust funds. At the same time, these official accounts made offsetting purchases of longer-term securities, including over $1.1 billion of issues due in more than 5 years. <u>These purchases, and the expectations of further purchases they created,</u> contributed to the decline in yields on longer maturities and thus helped to reduce the yield spread between short- and long-term Treasury obligations.[3]

The above quotation also indicates that the Federal Reserve considers purchases of longer-term securities as a factor contributing to long-term yield declines.

---

[3]"Recent Interest Rate Trends," <u>Federal Reserve Bulletin</u>, Vol. 49, No. 11 (November, 1963), p. 1503, (author's underlining).

Findings and Conclusions

The study of empirical evidence regarding the behavior of short- and long-term interest rates in recent years has shown that:

(1) Both short- and long-term rates advanced during 1961-64; the advance in short-term yields, however, was greater than the advance in long-term yields. Consequently, the spread between short- and long-term rates became progressively smaller.

(2) In the two previous cycles, short- and long-term rates in their cyclical troughs reached much lower levels than in the present cyclical trough.

(3) The shape of yield curves changed considerably during the four-year period. In February, 1961 the yield curve had an upsweeping position indicating a wide spread between the yields of shorter- and longer-term securities. In December, 1964 the yield curve had become almost flat. This was the result of steady rises in short- and intermediate-term yields. Long-term yields during 1961-64 rose only slightly.

These findings suggest that the behavior of short- and long-term rates was generally consistent with the objectives of operation twist. The change in the structure of interest rates materialized in the short- and intermediate-maturity areas. Yields in these areas rose considerably, thereby bringing about a different relationship between short- and long-term yields.

The contributions of the abandonment of bills only cannot be determined accurately. Under the assumption that changes in the supply of securities affect their yields, it can be concluded that the open market purchases of long-term securities has had a depressing effect on yields of long-term securities. Yields of short-term securities may also have been affected because the Federal Reserve could provide bank reserved by purchases of long-term bonds. Thus, short-term yields may have been lower and long-term yields higher had the bills only policy not been abandoned.

Additional consideration of the effects of Federal Reserve actions on market expectations and official Federal Reserve opinion also suggest that the termination of bills only facilitated the achievement of monetary objectives during 1961-64.

CHAPTER VII

THE TECHNICAL FUNCTIONING OF THE SECURITIES MARKET

Introduction

There is one more issue related to open market policy which must be evaluated. This is the technical functioning of the market for Government securities. In Chapter II, it was pointed out that the main argument which was presented by the Federal Reserve in favor of bills only was based on technical considerations of the Government securities market. The question that is of relevance to the present study is the one of whether the extension of open market operations to long-term securities has affected the technical performance of the securities market in an adverse way.

There are, as was indicated, two different views as to the importance of the technical functioning of the securities market. The Federal Reserve, at the time of the adoption of the bills only doctrine, considered the technical performance of the market as a very important factor in the execution of monetary policy. The Federal Reserve Bank of New York, on the other hand, took the position that the Federal Reserve System's primary responsibility should lie in the application of appropriate monetary policies in order to facilitate the achievement of major economic objectives rather than in the technical functioning of the securities market.

The evaluation of the technical performance of the market is undertaken for the sole purpose of determining whether the Federal Reserve claims that open market operations in long-term securities have adverse effects on the functioning of the securities market are correct. Whether the Federal Reserve views or those of its critics with respect to the role of the securities markets in monetary policy are valid is, of course, a different issue.

Criteria of Evaluation

Previous attempts to appraise the technical functioning of the securities markets have run into difficulties. As was indicated in Chapter III, part of these difficulties stem from the way the Federal Reserve defined depth, breadth, and resiliency, that is, the standards upon which the performance of the market was judged. The ad hoc subcommittee made it clear that in its definitions of these terms it was referring to the "inside market" which is reflected on the order books of securities dealers, and under such conditions besides being difficult to obtain the relevant data, there is also room for value judgments. The term depth, for example, was defined as the case when "...there are orders, either actual orders or orders that can be readily uncovered, both above and below the market."[1] The ambiguity of this definition is quite obvious. The volume of orders that can be readily uncovered would be a matter of opinion or judgment on the

---

[1]United States Congress, Joint Committee on the Economic Report, Subcommittee on Economic Stabilization, United States Monetary Policy: Recent Thinking and Experience, Hearings, Eighty-third Congress, Second Session (Washington, 1954), p. 265.

part of the securities dealers. Thus, it is hard to establish accurate or unbiased measures to evaluate the extent of depth that the market possesses. Similar problems are encountered with the definitions of breadth and resiliency. "The market has breadth when these orders are in volume..."[2] What constitutes a satisfactory volume of orders the subcommittee does not say. Presumably this again would depend upon dealer opinion. In the same way, the market is resilient "when new orders pour promptly..."[3] Again the word promptly could be subject to different interpretations.

More precise standards for appraising the technical performance of the market in terms of depth, breadth, and resiliency have been suggested by Allan Sproul. Sproul had expressed the opinion that the market had lost depth, breadth, and resiliency "...in terms of dealer willingness to take position risks, volume of trading, or erratic price movements."[4] Sproul's criteria are far less subject to ambiguity and individual opinion than those advanced by the ad hoc subcommittee. The extent of dealers' willingness to take position risks can be measured by the volume of inventories that the securities dealers carry. The other two standards--volume of trading and erratic price movements--can, also, be measured objectively.

To be sure, Sproul's criteria have also been recognized at one time or another by the Federal Reserve. The subcommittee report had

---

[2]Ibid., p. 265.

[3]Ibid.

[4]Ibid., p. 226.

argued that the uncertainties of Federal Reserve intervention in the long-term sector prevented dealers from carrying sufficient inventories. Both the ad hoc report and the Riefler analysis pointed out that open market operations in long-term securities carry the danger of creating wide fluctuations in security yields and prices.

Data for price and yield movements, have, of course, been available for a long time. In recent years, the Federal Reserve has also made available data on dealer inventory positions and dealer transactions.[5]

The present evaluation of performance of the securities market will be based on the criteria that Sproul has suggested. Before, however, the empirical evidence is analyzed a brief description of the securities market will be required.

The Government Securities Market

Transactions in Government securities are handled by a small group of securities dealers, most of whom have offices in New York City with branch offices and representatives throughout the country.[6] There are at the present time 20 primary securities dealers. Of these, six are commercial banks. The rest are securities houses, usually

---

[5]The Federal Reserve Bulletin has been publishing such data since September, 1960.

[6]In the discussion of this section the author has drawn heavily upon Robert V. Roosa, Federal Reserve Operations in the Money and Government Securities Market (New York, 1956); and Ira O. Scott, Jr., Government Securities Market (New York, 1965), pp. 75-117.

referred to as nonbank dealers. With two exceptions, all of the bank and nonbank dealers are incorporated. The two exceptions--both nonbank--are organized as partnerships. A few of the nonbank dealers, in addition to handling securities, also engage in a wide range of investment banking activities. The rest confine their activities almost entirely to Government securities.

The willingness of dealers to operate in all maturity issues depends largely upon the sizes of their firms. The larger firms are usually willing to do business in all maturities. Some of the smaller firms, however, restrict their activities to Treasury bills only.

The organization of each of the dealer firms may be divided into the following categories: Trading, selling, clearing, computing, and research. Trading is the most important function in the firm. The trader of the dealer firm is responsible for setting the terms upon which the firm is willing to buy or sell securities. Firms which handle securities in all maturity issues usually have several traders, each specializing in a particular maturity sector. There may be, for example, a bill trader, a trader in notes and certificates, a trader in intermediate- and long-term bonds, etc. To set the terms according to which securities will be bought and sold a trader must have a thorough knowledge of the factors which influence the securities market. To acquire and maintain such knowledge the trader follows press releases by the Treasury and Federal Reserve, shifts in institutional portfolios, the views expressed by congressmen, and other news affecting the market. Often a trader may exchange views about market developments with traders of other firms.

Selling involves the soliciting of orders from customers and reporting them to the traders. In the home office, salesmen are situated in close proximity to the trader so that they can request information regarding bids and offers and relay it to interested parties. The sales department in the home office also serves as a link with representatives and sub-offices located outside New York City. Communications between the home office and its branches are carried primarily through telephone and teletype. The use of telephone is quite indispensable in the dealer's operations. Certain negotiations because of their complexity cannot be carried through by teletype and must be completed by telephone.[7]

Another important unit in the operations of the dealer firm is the department for financing, clearing, and accounting. Purchases and sales of securities are cleared and recorded by this department. It is the responsibility of this department also to see how the purchases are financed. As will be shown later, dealers depend heavily upon borrowed funds for the financing of their operations.

The departments for computations and research complete the organization of the dealer firm. The former is the department where yields and prices for various maturities are calculated with the help of computers, while the latter is responsible for gathering and analyzing information related to Government securities. Such information is

---

[7]In fact, the use of telephone by dealers is so extensive that I. O. Scott, Jr. remarked that "...the over-the-counter market in Government securities is primarily an over-the-telephone market." Scott, p. 80.

useful to traders and salesmen as well as to those charged with formulation of the overall policy of the firm.

Federal Reserve and Dealer Relations

The main link between the Federal Reserve System and the securities dealers is provided by the Trading Desk of the Securities Department of the Federal Reserve Bank of New York. It is through the Trading Desk that open market policy decisions made by the Federal Open Market Committee are executed. If, for example, the Federal Open Market Committee wishes to decrease the level of member bank reserves, the manager of the Open Market Account through the Trading Desk will sell securities to dealers. Nonbank dealers pay for their purchases by drawing on their accounts with a member bank. Bank dealers pay by debiting their own reserve account. In either case, member bank reserves will be reduced.

If the Federal Reserve wants to perform an open market operation in Treasury bills, the usual procedure is to instruct the Trading Desk to contact each dealer firm and ask for a bid or an offer. With all dealers contacted, the Desk will select the most favorable quotations to complete the open market transaction. In cases where maturity issues other than bills are involved the Trading Desk approaches only those dealers who have made quotations on such issues at an earlier date. If the earlier dealer quotations are still standing, the Desk may be able to perform the operation without further solicitation.

It is not necessary for a dealer to respond with a bid or an offer each time he is contacted by the Trading Desk. However, should

he fail to respond for a prolonged period of time, he runs the risk of being eliminated from the Federal Reserve's list of recognized dealers.

Market Quotations

Treasury bills are quoted in the market in terms of yields and such quotations are refined to .01 of one percent or one "basis point." Thus, a 91-day bill may be quoted in the dealer market at 3.50 percent bid and 3.47 percent offered. Since yields are inversely related to prices, the dealer's sale price of a block of bills with a given par or maturity value will be greater than the dealer's purchase price for the same block of bills. The spread between a dealer's bid and offer quotation constitutes one of the sources of dealer income.

Spreads are also maintained for trading certificates, notes and bonds. But market quotations for such issues are expressed in terms of prices rather than yields. A block of Treasury bonds bearing a three percent rate of interest and having a maturity value of $1,000,000, for example, may be quoted by dealers at 99.8 bid and 99.16 offered. The figures after the decimal point represent thirty-seconds. The previous quotation would actually be read as 99 8/32 bid and 99 16/32 offered.[8]

---

[8]If the dealer's offer was accepted in this example, the buyer would have to pay the dealer (0.99 16/32)($1,000,000) = $995,000. An acceptance of the dealer's bid, on the other hand, would require the dealer to pay a principal amount of (0.99 8/32)($1,000,000) = $992,500. In addition to the principal amount, the purchaser must pay the seller any interest accrued from the last interest-payment date to the date of delivery.

Dealer Financing and Dealer Profits

Bank dealers use mainly the bank's own funds to finance any securities they acquire. Nonbank dealers, on the other hand, are in continuous need of borrowed funds to pay for the securities they maintain in their inventories. Securities dealers are not required to meet Federal Reserve margin requirements. Borrowed funds may be obtained on a margin as low as two percent for long-term bonds and one percent for intermediate-term bonds. No equity capital is required for buying Treasury bills. The dealer may borrow an amount equal to the total cost of the bills. Thus, the greatest part of dealer inventory positions is financed through borrowing. The ratio of total positions to net worth is around twenty-five to one.[9]

The nonbank dealers rely primarily upon two sources for borrowed funds. These are call loans and repurchase agreements. Call loans represent short-term funds such as Federal funds advanced by banks to securities dealers. The duration of such loans is usually one day. The securities purchased with the proceeds of the loan are used as collateral. Repurchase agreements involve the sale of securities under the provision that the seller will repurchase the same securities at a future date. Dealers who enter into repurchase agreements use the proceeds to finance their positions.[10] The length of time for which the agreement is extended varies from overnight to several weeks.

---

[9] Scott, p. 101.

[10] For the importance of the repurchase agreements in dealer financing, see Federal Reserve Bank of Cleveland, Money Market Instruments (Cleveland, 1965), pp. 19-30.

Repurchase agreements are made with both private institutions and the Federal Reserve Bank of New York. Among the principal users of repurchase agreements are nonfinancial corporations and commercial banks outside New York City. The rate of interest that dealers have to pay for repurchase funds is lower than the call loan rate.[11] Although, as was indicated in Chapter IV, the Federal Reserve Bank of New York uses repurchase agreements with dealers as an instrument of monetary policy, the dealers look upon such transactions as another source of borrowed funds. Repurchase agreements are usually made at the initiative of the New York Bank and only nonbank dealers are elegible to enter into such transactions. The rate of interest that the Federal Reserve charges the dealers for repurchase money is normally equal to the discount rate--except during periods of easy money when the rate may be lower.[12]

Dealer profits may be derived from capital gains, interest, and trading. Capital gains are realized when the prices of securities in the dealer's inventory rise. Interest profit is possible if the interest that the dealer receives from his security holdings is greater than the interest cost involved in financing his inventory positions. The difference between interest received and interest paid, however, is not always positive. During the period 1948-1958 dealers paid more interest than they received in each of the years 1956, 1957, and 1958.[13]

---

[11]Ibid., p. 29.

[12]Scott, p. 106.

[13]Ibid., p. 113.

Finally, another source of dealer profits is the spread which dealers maintain between bid and offer quotations.

How Dealers "Make Markets"

"Making a market" simply means that the dealer is willing to enter into a transaction involving purchases or sales of securities. Thus, one of the conditions for making markets is that the dealer stand ready to quote bids and offers for all securities traded. Willingness on the part of the dealer to narrow his spread reflects a greater interest on his part to make markets. The dealer's willingness, however, to make markets is tempered by the possibility of incurring capital losses. Dealers, as a rule, act as principals and not brokers. That is, they buy and sell securities for their own accounts. When, then, a dealer takes a position in which he acquires securities he runs the risk of suffering capital losses if the price of the securities should decline. But the making of markets requires that the dealer maintain adequate levels of inventories so that he can meet customer demands. Therefore, the volumes of dealer trading and inventory positions during a given period reflect the extent by which the dealer has been able to make markets during that period.

Volume of Trading

Judged in terms of the "volume of trading" the technical functioning of the securities market has shown an improvement during the period 1960-64. This conclusion is supported by the record of dealer transactions in Government securities whether these transactions are

considered in total of all maturities or are broken down by maturity sector. The examination of the data in Tables XV and XVI will verify this statement.

TABLE XV

DEALER TRANSACTIONS IN GOVERNMENT SECURITIES[a]

Month	1960	1961	1962	1963	1964
	(Par Value in Millions of Dollars)				
January	--	1,615	1,717	1,871	2,144
February	--	1,364	1,970	2,350	1,089
March	--	1,568	1,675	1,694	1,685
April	--	1,523	1,689	1,788	1,849
May	--	1,519	1,694	1,639	1,702
June	--	1,383	1,681	1,574	1,488
July	--	1,783	1,682	1,775	1,936
August	--	1,395	1,603	1,308	1,453
September	1,049	1,442	1,913	1,799	1,510
October	1,460	1,690	1,967	1,575	1,749
November	1,435	1,686	1,770	1,713	1,864
December	1,547	1,653	2,071	1,719	2,052
Average for the Year	1,373[b]	1,552	1,786	1,734	1,770

[a]Data are averages of daily figures based on the number of trading days in the period.

[b]Based on data from September through December.

Source: Federal Reserve Bulletin, various issues.

Table XV shows the volume of dealer transactions in terms of monthly and yearly averages.[14] The yearly figures indicate that the volume of transactions has increased in the 1960-64 period. The variation in the monthly volume of transactions suggests that the growth over the five-year period has been somewhat irregular. Nevertheless, the average volume of transactions based on daily figures during 1964 was $1,770 million, as compared with an average of $1,373 million during 1960 and $1,552 million during 1961 which is the first full year with data on dealer transactions. The 1964 figure represents an increase of 28.9 percent in the average volume of transactions over 1960 and 14.0 percent over 1961.

Table XVI shows the volume of dealer transactions in the various maturity sectors. The figures are annual averages based on daily figures.

Apart from securities in the intermediate sector, the volume of dealer transactions in all other maturity sectors increased over the five-year period. In issues maturing within 1-5 years, the volume of transactions dropped from an average of 283 million in 1960 to an average of 220 million in 1964. This was a decrease of 22.3 percent. On the other hand, the average volume of transactions during the same

---

[14]The transactions data combine the par value of Government securities purchased or sold in the market as reported by the major securities dealers to the Federal Reserve Bank of New York. Excluded from these transactions are allotments of and exchanges for new Government securities, redemptions of called or matured issues, securities under repurchase agreements, and securities under reverse repurchase agreements (i.e., those purchased by dealers under the stipulation that they would have to be resold to the original owner at a future date).

period rose by 39.0 percent in issues maturing within a year, by 103.2 percent in those maturing within 5-10 years, and by 20.6 percent in those issues maturing after 10 years.

TABLE XVI

DEALER TRANSACTIONS IN GOVERNMENT SECURITIES BY MATURITY[a]

Year	Within 1 Year	1-5 Years	5-10 Years	After 10 Years
	(Par Value in Millions of Dollars)			
1960[b]	994	283	62	34
1961	1,203	266	53	30
1962	1,401	228	121	37
1963	1,324	218	143	50
1964	1,382	220	126	41

[a]Averages of daily figures based on the number of trading days in the year.

[b]Based on data from September through December.

Source: Computed from data in Appendix Table II.

Thus, the study of relevant data on dealer transactions does not indicate a deterioration in the performance of the securities market but rather an improvement of it.

Dealer Inventory Positions

As in the case of dealer transactions in Government securities, the Federal Reserve apprehensions regarding the possible adverse effects that open market operations in long-term securities might have on dealer inventory positions seem to have been unwarranted. The empirical evidence from Tables XVII and XVIII make this point clear.

TABLE XVII

DEALER INVENTORY POSITIONS IN GOVERNMENT SECURITIES[a]

Month	1960	1961	1962	1963	1964
	(Par Value in Millions of Dollars)				
January	--	2,970	2,778	4,021	3,582
February	--	2,794	2,265	3,410	3,475
March	--	2,077	3,056	3,547	2,775
April	--	2,463	3,771	3,467	2,393
May	--	2,808	3,642	3,494	3,087
June	--	2,253	3,777	3,093	3,475
July	--	2,610	2,881	2,881	3,817
August	--	2,535	2,647	3,096	4,313
September	2,649	2,497	3,177	3,689	3,954
October	2,294	3,227	3,569	3,538	3,358
November	2,394	3,808	4,013	3,546	3,692
December	2,977	2,939	4,268	3,090	3,252
Average for the Year	2,578[b]	2,748	3,320	3,406	3,431

[a]Averages of daily figures based on number of trading days in the period.

[b]Based on data for September through December.

Source: Federal Reserve Bulletin, various issues.

Table XVII shows the average volume of dealer inventory positions by month and by year.[15] The data indicate that the volume of dealer positions has increased steadily in the 1960-64 period. The average

[15]Positions figures are reported on a commitment basis. This means that securities are added to the dealer's position at the time the dealer agrees to purchase them and deducted from positions when a commitment to sell is made. The figures include all securities sold by dealers under repurchase contracts, but exclude those that dealers have purchased under conditions to resell them to the original owner.

volume of dealer inventories rose by $853 million during this period. Expressed as a percentage, this rise amounted to 29.6 percent.

The data in Table XVIII show that average volume of dealer positions in 1-5 year issues decreased, while the volume of inventories in issues maturing within a year and after five years rose over the period 1960-64. Of particular importance is the fact that inventories in long-term issues rose from an average of $146 million in 1960 to $217 million in 1964. It was this area that the Federal Reserve had predicted would be most adversely affected by the extension of open market operations to long-term securities.

TABLE XVIII

DEALER INVENTORY POSITIONS IN GOVERNMENT SECURITIES BY MATURITY[a]

Year	Within 1 Year	1-5 Years	After 5 Years
	(Par Value in Millions of Dollars)		
1960[b]	1,936	496	146
1961	2,357	338	54
1962	2,923	276	122
1963	2,876	385	145
1964	2,901	313	217

[a]Averages of daily figures based on number of trading days in the period.

[b]Based on data from September through December.

Source: Computed from data in Appendix Table III.

In short then, the overall evidence indicates that the condition of the dealer inventory positions has improved during the years 1960-64. Furthermore, if the volume of inventories represents the dealers'

willingness to take risks, as Sproul and the Federal Reserve have indicated, then the increased volume of inventories during this period leads to the conclusion that the dealers' willingness to take position risks has increased also.

Erratic Price Movements

The third criterion that Sproul has suggested for judging the technical performance of the securities market is the extent of fluctuations in security prices.

The prices of securities are inversely related to security yields. Therefore, the question of price fluctuations can be dealt with by examining the variation in security yields.

In Chapter VI, the analysis of time series indicated that the yields of every maturity class during the period 1956-60 fluctuated more widely than their counterparts for the period 1961-64. Such evidence does not support the Federal Reserve predictions that the extension of open market operations to long-term securities would create wide fluctuations in security prices.

In addition to the evidence of Chapter VI, Table XIX shows the degree of variation in the yields of various maturities for the periods 1956-60 and 1961-64 as measured by standard deviations. It is obvious that the values of the standard deviations in every maturity class decreased during the 1961-64 period. In bills, the standard deviation in yields for 1956-60 was .8039 percent as compared to a value of .4529 percent for the standard deviation in the 1961-64 period. The differences in standard deviations for the two periods were even more profound

in the other three maturity classes. In long-term bonds, for example, the value of the standard deviation for the 1961-64 period was almost four times smaller than the standard deviation of the preceding five-year period.[16]

TABLE XIX

STANDARD DEVIATIONS IN YIELDS OF GOVERNMENT SECURITIES BY MATURITY

Period	91-Day Bills	9-12 Month Issues	3-5 Year Issues	Long-Term Bonds
		(Percent)		
1956-1960	.8039	.9022	.6772	.4290
1961-1964	.4529	.3551	.2559	.1198

There is, clearly, no evidence that the termination of bills only has produced wider price or yield movements.

[16]The author recognizes that for a given yield change in two different maturity issues the price of the longer maturity will change more than the price of the shorter maturity issue. Thus, it is not correct to compare the standard deviations computed from yields of two different maturity issues and then draw conclusions about price fluctuations in issues involved. The standard deviation of .4290 in the yields of long-term bonds during the period 1956-60, for example, is slightly over half the value of the standard deviation of .8039 for 91-day bills. This does not mean that bill prices fluctuated more widely than prices of long-term bonds. It is, however, correct to say that a standard deviation of .4290 as compared with a standard deviation of .1198 for the period 1961-64 indicates that the price of long-term bonds for the period 1956-60 fluctuated more than in the period 1961-64.

Summary and Conclusions

The present chapter has dealt with the question of whether the termination of the bills only policy has affected the technical functioning of the securities market in an adverse way.

After examining the issues and the difficulties involved in an evaluation of the technical performance of the market, it was decided that the market performance be judged strictly on the criteria that Allan Sproul had suggested, namely, the volume of dealer transactions, the volume of inventory positions, and erratic price movements. These criteria are quite similar to the ones that the Federal Reserve had used on various occasions.

Data on dealer transactions and inventory positions have become available since September, 1960. Their examination, however, shows no evidence that the technical performance of the securities market has worsened in recent years. On the contrary, the steady growth in the volume of dealer transactions and inventory positions for the period starting with the last four months of 1960 up to the end of 1964 suggests that the performance of the market has actually improved with respect to these two criteria. The same holds true with regards to erratic price movements. The evidence is that security prices and yields have fluctuated less during the period 1961-64 than they did during 1956-60.

Thus, the technical functioning of the securities market, against the beliefs and pronouncements of the ad hoc subcommittee and other Federal Reserve officials, does not seem to depend on whether or not open market operations are confined to bills only.

CHAPTER VIII

SUMMARY AND CONCLUSIONS

The primary purpose of this dissertation has been to appraise certain issues arising out of Federal Reserve open market policy in recent years. The process of defining and evaluating these issues, however, has required the review of several topics directly or indirectly related to open market operations, such as the various theories in regard to the term structure of interest rates, the economic conditions and monetary objectives during the 1961-64 period, the record of Federal Reserve transactions for the years 1954-64, and others.

Federal Reserve actions in the open market were governed by two different policies during the period 1953-64. The first of these two policies, which was in effect from 1953 until 1961, has been generally referred to as the bills only doctrine. The main provisions of this policy were the restriction of open market operations in all cases other than disorderly conditions in the securities market to short-term securities and the limitation of open market intervention to such a minimum as dictated by the credit needs of the economy. Since 1961, the Federal Reserve has followed an open market policy which, in effect, constitutes a reversal of the previous policy in terms of both restrictions on the magnitude of open market intervention and the particular sector that intervention may take place. Thus, open market transactions

during the 1961-64 period have been characterized by a greater volume and by a wider range of maturity issues bought and sold.

The decision to limit open market operations to a minimum and to bills only was the result of a study made by an ad hoc subcommittee during 1952-53. The study recommended the confinement of open market operations to short-term securities because it believed that such confinement would improve the technical performance of the securities market in terms of depth, breadth, and resiliency. Little consideration was given to the theories regarding the role and term structure of interest rates. It was merely pointed out that insofar as the subcommittee was concerned any changes in short-term yields would be transferred to the other sectors of the market through the forces of arbitrage, speculation, and substitution. Later, in 1958, when the Federal Reserve published a reappraisal of its open market policy, the theoretical implications of the bills only policy were examined in greater detail. In fact, at that time, the main line of defense on behalf of the bills only doctrine shifted from technical to theoretical arguments.

Again, the Federal Reserve stressed the roles of arbitrage, speculation, and substitution and emphasized that long-term interest rates are not insensitive to short-term interest rate changes. In addition, the 1958 reappraisal advanced the argument that open market operations influence interest rates primarily through their effects on member bank reserves. Thus, operations in long-term securities would produce almost the same results on long-term rates that would have been realized if the operations were performed in short-term securities. But

operations in long-term securities, the Federal Reserve pointed out, carry the danger of creating mistaken expectations on the part of professional dealers and other market participants which could upset the technical functioning of the market. Thus, the advisability of open market operations in long-term securities was rejected by the Federal Reserve in the final analysis on the basis of technical considerations.

Several factors contributed to the termination of the bills only policy in February, 1961. The doctrine was placed under scrutiny as soon as it became known. For the most part, academic economists reached critical conclusions about bills only. Such criticisms constituted a major factor in the abandonment of the doctrine. The emergence of deficits in the balance of payments provided another important argument in favor of changing this policy.

Monetary policy during the 1961-64 period was directed toward the achievement of higher short-term interest rates in relation to long-term rates for the purpose of reducing short-term capital outflows without discouraging domestic investment. This policy has been labeled operation twist. One of the major instruments used by the Federal Reserve for the implementation of operation twist was open market operations.

The review of open market operations during the period 1953-64 suggested the need for an empirical examination of three questions of relevance to open market policy. The first of these was the question of whether and to what extent yield changes in a given maturity sector are followed by similar changes in other sectors. The data used to evaluate this question were weekly yields on various maturity issues

for the period 1956-64. The week-by-week examination of the direction in yield changes for two different maturity issues showed that there is very little evidence to support the Federal Reserve contention that there is a great deal of parallel movement in the yields of short- and long-term securities. About one-third of the weekly changes in these two yields were in the opposite direction. Yield movements between intermediate- and long-term rates were more consistent with the Federal Reserve assumption. In about 15 percent of the weeks, the yields of these two issues changed in opposite directions. These findings corresponded closely with the results of correlation analysis. The highest coefficients were obtained from the yield correlation of 3-5 year issues and long-term bonds. The results of correlating short- and long-term rates indicated that, generally, only 25 percent of the variation in long-term yields could be attributed to the variation in short-term yields. The degree of association between the differences in yields from week-to-week was found to be, also, low. In short, the assumption that yield changes in the short-term sector are promptly transferred to the other maturity sectors of the market does not seem to be supported by the empirical findings. Furthermore, the failure to find any lags between short- and long-term yields casts doubt upon the view that short-term changes are of prime importance in determining rate changes in the long-term sector. These findings imply that the Federal Reserve cannot control long-term rates by limiting its actions to affecting short-term yields. Some control over long-term rates is possible if Federal Reserve influence is extended to the intermediate sectors.

But, if the Federal Reserve wants to control the absolute level of long-term rates, then it must be willing to extend its operations to the long-term sector.

The second issue that was examined empirically concerned an evaluation of whether the objectives of operation twist were achieved. The evidence from time series and yield curves showed that since 1961 the yield differential between short- and long-term issues declined progressively and consequently the yield curve became almost flat. Thus, the objective of raising short-term rates relative to long-term was achieved. The effect that the extension of open market operations to the long-term sector had on the achievement of higher short-term rates relative to long-term rates cannot be established exactly. The Federal Reserve, however, may have had to provide bank reserves by purchases of short-term securities had it not been able to purchase longer-term issues during the 1961-64 period. This eventually would have exerted downward pressure on short-term yields.

Finally, the third major issue discussed was the question of whether the extension of open market operations to longer-term securities had adverse effects on the technical functioning of the securities market. The study of dealer transactions and dealer inventory positions for the period beginning September, 1960, through December, 1964, showed an increase in the volume of both variables over this period. The examination of yield movements showed less fluctuation for the period 1961-64 than for the period 1956-60. Also, the dispersion of weekly yields measured in terms of standard deviations was smaller during the 1961-64 period than that of the period 1956-60.

Such evidence is contrary to the Federal Reserve argument that open market operations in long-term securities would affect the performance of the market in an adverse way.

In conclusion, it might be mentioned that the present study did not consider directly the question of whether or not the bills only policy was an incorrect policy. However, the assumptions regarding parallel yield changes and the technical functioning of the market, on which this policy was based, were found to be unwarranted. Therefore, the bills only policy, judged on the merit of its assumptions, would appear to have been ill-conceived.

SELECTED BIBLIOGRAPHY

Ahearn, Daniel S. Federal Reserve Policy Reappraised, 1951-1959. New York: Columbia University Press, 1963.

Ascheim, Joseph. Techniques of Monetary Control. Baltimore: Johns Hopkins Press, 1961.

Axilrod, Stephen H. and Janice Krummack. "Federal Reserve Security Transactions, 1954-64." Federal Reserve Bulletin, Vol. 50, No. 7 (July, 1964), pp. 822-837.

Board of Governors of the Federal Reserve System. Fortieth Annual Report. Washington: Board of Governors of the Federal Reserve System, 1953.

_____. Forty-fifth Annual Report. Washington: Board of Governors of the Federal Reserve System, 1958.

_____. Forty-eighth Annual Report. Washington: Board of Governors of the Federal Reserve System, 1961.

_____. Annual Reports. Washington: Board of Governors of the Federal Reserve System, 1961-1964.

Conard, Joseph W. An Introduction to the Theory of Interest. Berkeley: University of California Press, 1959.

Culbertson, J. M. "The Term Structure of Interest Rates." Quarterly Journal of Economics, Vol. 71 (November, 1957), pp. 485-517.

Eastburn, David P. The Federal Reserve on Record, Readings on Current Issues from Statements by Federal Reserve Officials. Philadelphia: Federal Reserve Bank of Philadelphia, 1965.

Federal Reserve Bank of Cleveland. Money Market Instruments. Cleveland: Federal Reserve Bank of Cleveland, 1965.

Federal Reserve Bank of New York. Annual Reports. New York: Federal Reserve Bank of New York, 1961-1964.

Federal Reserve Bulletin. Vol. 48, No. 3 (September, 1962), pp. 1105 and 1108.

_____. Vol. 50, No. 7 (July, 1964), pp. 825 and 837.

Federal Reserve Chart Book. Washington: Board of Governors of the Federal Reserve System, January, 1965, p. 24.

Hicks, J. R. Value and Capital. 2nd Ed. London: Clarendon Press, 1946.

Johnson, Harry G. "Major Issues in Monetary and Fiscal Policies." Federal Reserve Bulletin, Vol. 50, No. 11 (November, 1964), pp. 1400-1413.

Luckett, Dudley G. "Bills Only: A Critical Appraisal." Review of Economics and Statistics, XLII (August, 1960), pp. 301-306.

Lutz, F. A. "The Structure of Interest Rates." Quarterly Journal of Economics, Vol. 55 (November, 1940), pp. 36-63.

Martin, William McC., Jr. "The Transition to Free Markets." Federal Reserve Bulletin, Vol. 39, No. 4 (April, 1953), pp. 330-335.

Meiselman, David. The Term Structure of Interest Rates. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1962.

"Recent Interest Rate Trends." Federal Reserve Bulletin, Vol. 49, No. 11 (November, 1963), pp. 1495-1504.

Report of the Commission on Money and Credit. Money and Credit. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1961.

Riefler, Winfield W. "Open Market Operations in Long-Term Securities." Federal Reserve Bulletin, Vol. 44, No. 11 (November, 1958), pp. 1260-1274.

Robinson, Roland. The Management of Bank Funds. New York: McGraw-Hill Book Company, 1950.

Roosa, Robert V. Federal Reserve Operations in the Money and Government Securities Markets. New York: Federal Reserve Bank of New York, 1956.

_____. "Interest Rates and the Central Bank." Money, Trade, and Economic Growth. Essays in Honor of John Henry Williams. New York: The Macmillan Company, 1951.

Samuelson, Paul A. "A Recent American Monetary Controversy." Three Banks Review, No. 29 (March, 1956), pp. 3-21.

Scott, Ira O., Jr. Government Securities Market. New York: McGraw-Hill Book Company, 1965.

Smith, Warren L. "The Instruments of General Monetary Control." The National Banking Review, Vol. 1, No. 1 (September, 1963), pp. 47-76.

Tobin, James. "A New Theory of Credit Control: The Availability Thesis." The Review of Economics and Statistics, Vol. XXXV, No. 2 (May, 1953), pp. 118-127.

United States Congress. Joint Committee on the Economic Report, Subcommittee on Economic Stabilization, Hearings. United States Monetary Policy: Recent Thinking and Experience. Eighty-third Congress, Second Session. Washington: U. S. Government Printing Office, 1960.

_____. Report of the Joint Economic Committee. Employment, Growth, and Price Levels. Eighty-sixth Congress, Second Session, Report No. 1043. Washington: U. S. Government Printing Office, 1960.

United States Department of Commerce. Survey of Current Business, various issues.

United States Treasury Department. Office of the Secretary. Treasury Bulletin, various issues.

Whittlesey, C. R. "Federal Reserve Policy: Disclosure and Nondisclosure." The National Banking Review, Vol. 1, No. 1 (September, 1963), pp. 77-87.

Wood, J. H. "Expectations, Errors, and the Term Structure of Interest Rates." The Journal of Political Economy, Vol. LXXI (April, 1963), pp. 170-171.

A P P E N D I C E S

APPENDIX TABLE I

WEEKLY YIELDS OF U. S. GOVERNMENT SECURITIES[a]

Week Ending	3-Month Bills[b]	9-12 Month Issues[c]	3-5 Year Issues[c]	Long-Term Bonds
		(Percent)		
1956-Jan. 7	2.51	2.69	2.87	2.92
14	2.53	2.58	2.81	2.90
21	2.39	2.41	2.68	2.87
28	2.28	2.39	2.66	2.87
Feb. 4	2.29	2.40	2.65	2.85
11	2.26	2.34	2.63	2.85
18	2.36	2.34	2.63	2.84
25	2.40	2.41	2.67	2.87
Mar. 3	2.24	2.47	2.71	2.87
10	2.24	2.42	2.75	2.89
17	2.36	2.44	2.81	2.92
24	2.26	2.42	2.89	2.95
31	2.19	2.42	2.94	2.98
Apr. 7	2.38	2.68	3.02	3.04
14	2.55	2.78	3.07	3.07
21	2.74	2.93	3.18	3.10
28	2.71	2.92	3.16	3.09
May 5	2.61	2.91	3.10	3.03
12	2.55	2.88	3.11	3.00
19	2.67	2.87	3.08	2.98
26	2.65	2.75	2.97	2.94
June 2	2.55	2.74	2.91	2.92
9	2.53	2.82	2.91	2.22
16	2.51	2.72	2.85	2.91
23	2.41	2.60	2.83	2.92
30	2.48	2.60	2.90	2.95
July 7	2.33	2.56	2.85	2.94
14	2.33	2.54	2.90	2.97
21	2.26	2.55	2.96	3.01
28	2.32	2.74	3.09	3.05
Aug. 4	2.29	2.85	3.19	3.09
11	2.40	2.92	3.26	3.11
18	2.64	3.00	3.37	3.16
25	2.82	3.10	3.43	3.22

APPENDIX TABLE I (Continued)

Week Ending	3-Month Bills[b]	9-12 Month Issues[c]	3-5 Year Issues[c]	Long-Term Bonds
		(Percent)		
Sept. 1	2.72	3.10	3.46	3.22
8	2.68	3.14	3.49	3.24
15	2.79	3.19	3.48	3.23
22	2.91	3.16	3.36	3.19
29	2.94	3.18	3.39	3.20
Oct. 6	2.87	3.11	3.25	3.17
13	2.96	3.10	3.25	3.18
20	2.94	3.06	3.23	3.19
27	2.86	3.02	3.34	3.24
Nov. 3	2.85	3.09	3.45	3.27
10	2.91	3.09	3.45	3.28
17	2.98	3.10	3.42	3.28
24	3.04	3.16	3.45	3.30
Dec. 1	3.08	3.23	3.60	3.35
8	3.12	3.26	3.67	3.35
15	3.24	3.30	3.68	3.37
22	3.27	3.37	3.66	3.45
29	3.20	3.40	3.57	3.44
1957-Jan. 5	3.14	3.38	3.63	3.50
12	3.08	3.23	3.47	3.45
19	3.09	3.14	3.33	3.33
26	3.10	3.09	3.31	3.26
Feb. 2	3.16	3.11	3.34	3.24
9	3.05	3.15	3.27	3.18
16	3.01	3.24	3.29	3.19
23	3.15	3.29	3.36	3.26
Mar. 2	3.25	3.29	3.38	3.27
9	3.18	3.33	3.29	3.28
16	3.15	3.38	3.37	3.26
23	3.00	3.35	3.39	3.26
30	2.97	3.35	3.38	3.24
Apr. 6	3.03	3.36	3.42	3.25
13	3.13	3.41	3.46	3.28
20	3.11	3.44	3.49	3.34
27	3.02	3.44	3.51	3.38

APPENDIX TABLE I (Continued)

Week Ending	3-Month Bills[b]	9-12 Month Issues[c]	3-5 Year Issues[c]	Long-Term Bonds
		(Percent)		
May 4	3.00	3.43	3.54	3.38
11	2.93	3.36	3.55	3.37
18	2.98	3.35	3.60	3.40
25	3.14	3.35	3.63	3.41
June 1	3.26	3.42	3.72	3.47
8	3.30	3.51	3.69	3.49
15	3.27	3.53	3.68	3.52
22	3.36	3.59	3.84	3.66
29	3.23	3.58	3.86	3.64
July 6	3.19	3.66	3.82	3.59
13	3.13	3.68	3.83	3.56
20	3.04	3.70	3.90	3.59
27	3.18	3.74	3.98	3.65
Aug. 3	3.34	3.79	3.91	3.63
10	3.29	3.83	3.91	3.63
17	3.40	3.98	3.97	3.66
24	3.32	3.96	3.91	3.63
31	3.47	3.99	3.87	3.62
Sept. 7	3.54	4.00	3.86	3.59
14	3.55	4.00	3.91	3.60
21	3.58	4.01	3.94	3.71
28	3.48	4.06	3.98	3.72
Oct. 5	3.49	4.02	3.97	3.72
12	3.54	3.91	3.94	3.71
19	3.64	3.99	4.04	3.76
26	3.59	3.89	3.99	3.74
Nov. 2	3.59	3.90	4.01	3.74
9	3.50	3.77	3.91	3.68
16	3.38	3.54	3.80	3.62
23	3.12	3.34	3.43	3.49
30	3.14	3.38	3.32	3.48
Dec. 7	3.07	3.33	3.18	3.37
14	3.01	3.12	3.09	3.31
21	3.12	3.01	3.00	3.29
28	3.10	2.96	2.96	3.26

APPENDIX TABLE I (Continued)

Week Ending	3-Month Bills[b]	9-12 Month Issues[c]	3-5 Year Issues[c]	Long-Term Bonds
		(Percent)		
1958-Jan. 4	2.77	2.84	2.84	3.22
11	2.75	2.73	2.79	3.20
18	2.57	2.59	2.74	3.21
25	2.37	2.52	2.77	3.27
Feb. 1	1.92	2.29	2.78	3.28
8	1.65	2.09	2.78	3.27
15	1.69	2.05	2.72	3.25
22	1.62	1.93	2.67	3.25
Mar. 1	1.22	1.69	2.54	3.27
8	1.39	1.76	2.53	3.27
15	1.39	1.77	2.53	3.27
22	1.33	1.85	2.50	3.24
29	1.11	1.73	2.45	3.21
Apr. 5	1.08	1.54	2.44	3.19
12	1.10	1.29	2.40	3.15
19	1.13	1.31	2.32	3.10
26	1.13	1.32	2.22	3.07
May 3	1.23	1.39	2.30	3.14
10	1.11	1.33	2.29	3.14
17	1.02	1.26	2.26	3.15
24	0.74	1.13	2.23	3.13
31	0.58	1.01	2.20	3.13
June 7	0.71	0.91	2.14	3.14
14	0.83	0.91	2.17	3.15
21	0.92	0.97	2.28	3.21
28	0.90	1.10	2.39	3.26
July 5	0.79	1.13	2.45	3.26
12	0.95	1.25	2.51	3.31
19	0.94	1.44	2.57	3.39
26	0.88	1.36	2.50	3.38
Aug. 2	0.94	1.49	2.65	3.44
9	1.20	1.68	2.86	3.53
16	1.58	1.97	3.03	3.61
23	1.91	2.39	3.16	3.62
30	2.23	2.62	3.44	3.67

APPENDIX TABLE I (Continued)

Week Ending	3-Month Bills[b]	9-12 Month Issues[c]	3-5 Year Issues[c]	Long-Term Bonds
		(Percent)		
Sept. 6	2.32	2.76	3.56	3.72
13	2.37	2.81	3.56	3.75
20	2.45	2.83	3.55	3.76
27	2.48	2.85	3.56	3.74
Oct. 4	2.70	3.04	3.72	3.83
11	2.64	2.98	3.58	3.72
18	2.67	2.76	3.52	3.74
25	2.69	2.74	3.67	3.77
Nov. 1	2.53	2.67	3.66	3.75
8	2.49	2.87	3.62	3.75
15	2.71	2.90	3.59	3.71
22	2.73	2.94	3.60	3.69
29	2.72	2.96	3.58	3.67
Dec. 6	2.79	3.30	3.63	3.73
13	2.82	3.30	3.61	3.77
20	2.82	3.27	3.65	3.83
27	2.71	3.18	3.68	3.84
1959-Jan. 3	2.67	3.04	3.70	3.83
10	2.72	3.00	3.73	3.84
17	2.86	3.27	3.87	3.89
24	2.97	3.47	3.97	3.96
31	2.77	3.38	3.92	3.94
Feb. 7	2.70	3.44	3.94	3.93
14	2.72	3.40	3.92	3.92
21	2.63	3.33	3.77	3.91
28	2.76	3.34	3.77	3.90
Mar. 7	2.84	3.51	3.78	3.87
14	2.85	3.63	3.88	3.92
21	2.77	3.59	3.89	3.92
28	2.76	3.53	3.94	3.94
Apr. 4	2.84	3.50	3.96	3.95
11	2.96	3.52	3.99	3.97
18	3.09	3.70	4.04	4.01
25	2.98	3.78	4.09	4.05

APPENDIX TABLE I (Continued)

Week Ending	3-Month Bills[b]	9-12 Month Issues[c]	3-5 Year Issues[c]	Long-Term Bonds
		(Percent)		
May 2	2.81	3.80	4.08	4.05
9	2.83	3.86	4.10	4.05
16	2.76	3.93	4.18	4.09
23	2.85	3.97	4.17	4.11
30	2.92	3.93	4.18	4.08
June 6	3.15	3.99	4.28	4.10
13	3.27	3.97	4.31	4.09
20	3.24	3.88	4.33	4.09
27	3.22	3.98	4.36	4.10
July 4	3.16	4.13	4.40	4.12
11	3.28	4.38	4.42	4.13
18	3.37	4.33	4.38	4.08
25	3.15	4.32	4.41	4.10
Aug. 1	3.01	4.25	4.40	4.10
8	3.00	4.14	4.37	4.08
15	3.17	4.14	4.31	4.06
22	3.50	4.34	4.44	4.08
29	3.73	4.59	4.63	4.15
Sept. 5	3.95	4.69	4.71	4.24
12	4.02	4.73	4.73	4.25
19	4.13	4.91	4.86	4.30
26	3.98	4.78	4.79	4.27
Oct. 3	4.10	4.88	4.82	4.21
10	4.02	4.75	4.76	4.14
17	4.24	4.77	4.72	4.13
24	3.99	4.53	4.58	4.06
31	4.00	4.47	4.65	4.09
Nov. 7	4.03	4.62	4.70	4.09
14	4.04	4.62	4.71	4.10
21	4.20	4.73	4.75	4.13
28	4.24	4.80	4.78	4.15
Dec. 5	4.50	4.93	4.90	4.21
12	4.48	4.99	4.92	4.22
19	4.49	4.98	4.95	4.25
26	4.57	5.00	5.00	4.32

APPENDIX TABLE I (Continued)

Week Ending	3-Month Bills[b]	9-12 Month Issues[c]	3-5 Year Issues[c]	Long-Term Bonds
		(Percent)		
1960-Jan. 2	4.40	5.00	4.99	4.37
9	4.59	5.11	4.97	4.42
16	4.53	5.00	4.91	4.37
23	4.27	4.87	4.81	4.35
30	4.01	4.75	4.80	4.36
Feb. 6	3.94	4.61	4.69	4.29
13	3.67	4.41	4.61	4.20
20	4.04	4.63	4.64	4.16
27	4.14	4.63	4.70	4.22
Mar. 5	3.92	4.55	4.58	4.22
12	3.60	4.14	4.35	4.11
19	3.41	3.84	4.17	4.05
26	2.84	3.47	4.02	4.00
Apr. 2	2.88	3.69	4.11	4.07
9	2.96	3.57	4.06	4.10
16	3.56	4.23	4.25	4.18
23	3.34	4.17	4.32	4.21
30	3.19	4.14	4.34	4.20
May 7	3.08	4.11	4.37	4.17
14	3.32	4.08	4.35	4.13
21	3.50	4.34	4.51	4.18
28	3.29	4.26	4.48	4.16
June 4	2.94	3.87	4.24	4.07
11	2.61	3.47	4.12	4.00
18	2.31	3.15	3.99	3.96
25	2.39	3.29	4.01	3.97
July 2	2.18	3.20	3.99	3.96
9	2.27	3.23	3.87	3.91
16	2.41	3.18	3.76	3.87
23	2.31	3.12	3.67	3.84
30	2.24	3.00	3.54	3.81
Aug. 6	2.13	2.86	3.49	3.75
13	2.18	2.84	3.52	3.78
20	2.31	2.93	3.52	3.81
27	2.43	2.90	3.47	3.81

APPENDIX TABLE I (Continued)

Week Ending	3-Month Bills[b]	9-12 Month Issues[c]	3-5 Year Issues[c]	Long-Term Bonds
		(Percent)		
Sept. 3	2.53	2.93	3.51	3.84
10	2.56	2.98	3.51	3.84
17	2.58	3.03	3.53	3.84
24	2.43	2.98	3.47	3.79
Oct. 1	2.35	2.99	3.50	3.81
8	2.40	3.05	3.60	3.88
15	2.54	3.07	3.65	3.92
22	2.23	3.02	3.62	3.93
29	2.11	2.93	3.57	3.90
Nov. 5	2.20	2.84	3.59	3.90
12	2.40	2.86	3.63	3.91
19	2.46	3.08	3.69	3.92
26	2.38	3.08	3.72	3.94
Dec. 3	2.35	3.05	3.75	3.97
10	2.28	2.93	3.59	3.93
17	2.25	2.76	3.49	3.86
24	2.24	2.74	3.46	3.86
31	2.18	2.61	3.40	3.82
1961-Jan. 7	2.28	2.67	3.39	3.84
14	2.28	2.72	3.52	3.90
21	2.25	2.74	3.59	3.92
28	2.17	2.65	3.57	3.89
Feb. 4	2.29	2.72	3.57	3.88
11	2.35	2.76	3.56	3.84
18	2.40	2.87	3.56	3.81
25	2.51	2.93	3.48	3.76
Mar. 4	2.56	2.99	3.49	3.77
11	2.44	2.91	3.36	3.75
18	2.35	2.81	3.44	3.78
25	2.28	2.78	3.45	3.80
Apr. 1	2.38	2.86	3.43	3.81
8	2.36	2.92	3.45	3.82
15	2.31	2.82	3.40	3.81
22	2.25	2.79	3.38	3.81
29	2.23	2.81	3.32	3.78

APPENDIX TABLE I (Continued)

Week Ending	3-Month Bills[b]	9-12 Month Issues[c]	3-5 Year Issues[c]	Long-Term Bonds
		(Percent)		
May 6	2.22	2.76	3.23	3.72
13	2.23	2.75	3.15	3.70
20	2.29	2.82	3.24	3.71
27	2.39	2.91	3.43	3.78
June 3	2.38	2.98	3.56	3.79
10	2.40	3.02	3.69	3.86
17	2.32	3.01	3.67	3.86
24	2.31	3.02	3.74	3.90
July 1	2.27	3.01	3.71	3.93
8	2.31	2.98	3.69	3.92
15	2.25	2.88	3.72	3.92
22	2.19	2.82	3.66	3.88
29	2.22	2.84	3.68	3.99
Aug. 5	2.28	2.85	3.74	3.95
12	2.38	3.02	3.86	4.03
19	2.50	3.11	3.83	4.01
26	2.43	3.09	3.77	4.01
Sept. 2	2.34	3.06	3.77	4.01
9	2.32	3.06	3.81	4.02
16	2.29	3.05	3.80	4.06
23	2.26	3.03	3.76	4.02
30	2.25	2.98	3.70	3.98
Oct. 7	2.28	2.91	3.65	3.98
14	2.34	2.96	3.67	4.00
21	2.29	3.02	3.66	3.98
28	2.29	2.97	3.62	3.96
Nov. 4	2.28	2.91	3.61	3.95
11	2.40	2.89	3.63	3.96
18	2.53	2.96	3.70	4.00
25	2.54	2.99	3.69	3.98
Dec. 2	2.56	2.98	3.73	4.01
9	2.58	3.03	3.82	4.05
16	2.59	3.02	3.84	4.06
23	2.61	3.04	3.81	4.06
30	2.66	3.04	3.81	4.07

APPENDIX TABLE I (Continued)

Week Ending	3-Month Bills[b]	9-12 Month Issues[c]	3-5 Year Issues[c]	Long-Term Bonds
		(Percent)		
1962-Jan. 6	2.72	3.07	3.79	4.06
13	2.78	3.13	3.83	4.08
20	2.73	3.09	3.87	4.08
27	2.67	3.04	3.85	4.08
Feb. 3	2.69	3.04	3.88	4.10
10	2.70	3.06	3.83	4.09
17	2.81	3.14	3.78	4.08
24	2.74	3.20	3.73	4.12
Mar. 3	2.69	3.09	3.62	4.08
10	2.74	3.04	3.60	4.06
17	2.74	3.02	3.61	4.02
24	2.70	2.96	3.49	3.97
31	2.73	2.93	3.50	3.96
Apr. 7	2.72	2.88	3.43	3.90
14	2.74	2.94	3.47	3.89
21	2.72	2.96	3.48	3.88
28	2.73	2.98	3.52	3.90
May 5	2.74	2.97	3.52	3.87
12	2.67	2.91	3.47	3.85
19	2.67	2.99	3.55	3.87
26	2.69	3.04	3.57	3.90
June 2	2.68	3.00	3.53	3.89
9	2.65	2.97	3.50	3.88
16	2.69	2.97	3.46	3.87
23	2.73	3.03	3.50	3.90
30	2.84	3.12	3.60	3.95
July 7	2.92	3.18	3.66	3.99
14	2.97	3.22	3.71	4.03
21	2.95	3.27	3.73	4.03
28	2.88	3.25	3.71	4.02
Aug. 4	2.85	3.22	3.68	4.03
11	2.83	3.19	3.64	4.00
18	2.84	3.15	3.58	3.98
25	2.82	3.08	3.51	3.94

APPENDIX TABLE I (Continued)

Week Ending	3-Month Bills[b]	9-12 Month Issues[c]	3-5 Year Issues[c]	Long-Term Bonds
		(Percent)		
Sept. 1	2.80	3.06	3.52	3.94
8	2.82	3.08	3.56	3.96
15	2.78	3.01	3.59	3.95
22	2.77	2.97	3.57	3.94
29	2.75	2.95	3.51	3.93
Oct. 6	2.75	2.92	3.44	3.90
13	2.76	2.91	2.46	3.90
20	2.74	2.88	3.46	3.88
27	2.74	2.89	3.48	3.89
Nov. 3	2.74	2.87	3.45	3.87
10	2.82	2.89	3.43	3.86
17	2.82	2.91	3.46	3.87
24	2.84	2.94	3.49	3.88
Dec. 1	2.86	2.95	3.48	3.88
8	2.85	2.97	3.48	3.89
15	2.84	2.94	3.44	3.88
22	2.88	2.94	3.41	3.86
29	2.89	2.96	3.41	3.85
1963-Jan. 5	2.89	2.99	3.44	3.87
12	2.90	2.99	3.45	3.87
19	2.90	2.96	3.44	3.87
26	2.93	2.97	3.50	3.91
Feb. 2	2.93	2.95	3.50	3.90
9	2.95	2.89	3.47	3.92
16	2.93	2.87	3.46	3.91
23	2.90	2.88	3.46	3.92
Mar. 2	2.90	2.93	3.50	3.94
9	2.89	2.99	3.49	3.92
16	2.88	2.97	3.49	3.93
23	2.90	2.99	3.51	3.94
30	2.91	3.01	3.53	3.95
Apr. 6	2.91	3.02	3.53	3.95
13	2.90	3.01	3.54	3.96
20	2.90	3.04	3.59	3.99
27	2.89	3.00	3.59	3.98

APPENDIX TABLE I (Continued)

Week Ending	3-Month Bills[b]	9-12 Month Issues[c]	3-5 Year Issues[c]	Long-Term Bonds
		(Percent)		
May 4	2.90	3.00	3.56	3.98
11	2.91	3.00	3.54	3.97
18	2.90	3.03	3.55	3.96
25	2.94	3.10	3.59	3.97
June 1	2.98	3.17	3.64	3.99
8	3.00	3.21	3.68	4.00
15	2.98	3.18	3.66	3.99
22	2.98	3.15	3.68	4.00
29	2.99	3.14	3.67	4.00
July 6	3.03	3.20	3.72	4.02
13	3.22	3.35	3.80	4.03
20	3.19	3.40	3.80	4.02
27	3.19	3.35	3.79	4.00
Aug. 3	3.24	3.30	3.77	3.99
10	3.26	3.28	3.77	3.99
17	3.32	3.36	3.80	3.99
24	3.36	3.51	3.83	3.99
31	3.39	3.54	3.85	3.99
Sept. 7	3.36	3.54	3.88	4.03
14	3.36	3.54	3.88	4.05
21	3.41	3.54	3.89	4.05
28	3.38	3.53	3.88	4.04
Oct. 5	3.41	3.57	3.88	4.04
12	3.45	3.56	3.90	4.06
19	3.47	3.58	3.91	4.07
26	3.44	3.62	3.93	4.07
Nov. 2	3.47	3.61	3.94	4.09
9	3.54	3.66	3.98	4.12
16	3.55	3.68	3.97	4.10
23	3.51	3.75	3.98	4.10
30	3.48	3.74	3.97	4.10
Dec. 7	3.52	3.76	3.99	4.12
14	3.50	3.78	4.02	4.12
21	3.53	3.77	4.06	4.15
28	3.52	3.77	4.07	4.16

APPENDIX TABLE I (Continued)

Week Ending	3-Month Bills[b]	9-12 Month Issues[c]	3-5 Year Issues[c]	Long-Term Bonds
		(Percent)		
1964-Jan. 4	3.52	3.75	4.08	4.15
11	3.53	3.68	4.08	4.16
18	3.54	3.59	4.07	4.16
25	3.52	3.66	4.04	4.15
Feb. 1	3.50	3.67	4.04	4.15
8	3.51	3.66	3.99	4.14
15	3.52	3.66	4.00	4.14
22	3.53	3.58	4.02	4.14
29	3.56	3.61	4.05	4.15
Mar. 7	3.56	3.64	4.10	4.16
14	3.54	3.65	4.12	4.17
21	3.54	3.67	4.16	4.18
28	3.54	3.72	4.23	4.20
Apr. 4	3.52	3.71	4.21	4.20
11	3.48	3.68	4.19	4.20
18	3.47	3.64	4.18	4.20
25	3.45	3.58	4.16	4.19
May 2	3.45	3.56	4.14	4.19
9	3.49	3.55	4.10	4.18
16	3.47	3.52	4.04	4.16
23	3.47	3.84	4.07	4.14
30	3.47	3.84	4.06	4.14
June 6	3.47	3.84	4.05	4.15
13	3.47	3.84	4.04	4.14
20	3.49	3.84	4.04	4.13
27	3.47	3.85	4.02	4.12
July 4	3.48	3.76	4.01	4.11
11	3.48	3.68	3.99	4.12
18	3.43	3.64	3.98	4.13
25	3.46	3.70	4.00	4.14
Aug. 1	3.46	3.67	3.99	4.14
8	3.48	3.68	3.98	4.14
15	3.51	3.71	3.99	4.14
22	3.50	3.76	3.99	4.14
29	3.50	3.78	4.00	4.14

APPENDIX TABLE I (Continued)

Week Ending	3-Month Bills[b]	9-12 Month Issues[c]	3-5 Year Issues[c]	Long-Term Bonds
		(Percent)		
Sept. 5	3.50	3.82	4.03	4.16
12	3.52	3.84	4.04	4.17
19	3.54	3.83	4.05	4.17
26	3.54	3.80	4.02	4.16
Oct. 3	3.55	3.82	4.02	4.15
10	3.57	3.84	4.05	4.16
17	3.58	3.84	4.06	4.17
24	3.58	3.84	4.05	4.17
31	3.56	3.82	4.03	4.15
Nov. 7	3.56	3.82	4.02	4.12
14	3.58	3.82	4.00	4.11
21	3.61	3.83	4.02	4.11
28	3.78	4.00	4.11	4.15
Dec. 5	3.82	4.04	4.11	4.15
12	3.81	3.97	4.06	4.12
19	3.86	3.92	4.06	4.13
26	3.86	3.95	4.07	4.14

[a]Except for long-term bonds, weekly yields are averages computed from daily closing bid prices. Weekly yields for long-term bonds are averages of daily figures for U. S. Government bonds maturing or callable in 10 years or more.

[b]Market yields.

[c]Selected note and bond issues.

Source: Except for long-term bond yields for 1956 and 1957, Federal Reserve Bulletin's February issue for the years 1957-65; long-term bond yields for 1956 and 1957 are taken from Federal Reserve Bulletin, Vol. 44 (January, 1958), p. 84.

APPENDIX TABLE II

DEALER TRANSACTIONS IN U. S. GOVERNMENT SECURITIES BY MATURITY[a]

Period	Within 1 Year	1-5 Years	5-10 Years	After 10 Years
	(Par Value in Millions of Dollars)			
1960-Sept.	760	197	58	35
Oct.	1,160	227	45	28
Nov.	1,006	323	78	28
Dec.	1,049	386	67	45
1961-Jan.	1,113	422	57	23
Feb.	934	353	46	32
Mar.	1,144	320	70	33
Apr.	1,200	206	82	35
May	1,092	299	92	36
June	1,143	175	42	23
July	1,441	281	49	13
Aug.	1,173	162	41	19
Sept.	1,185	177	47	34
Oct.	1,389	254	27	20
Nov.	1,295	309	41	43
Dec.	1,328	228	45	52
1962-Jan.	1,478	149	64	26
Feb.	1,520	295	95	60
Mar.	1,332	217	69	56
Apr.	1,350	180	114	45
May	1,338	218	114	24
June	1,357	191	100	33
July	1,457	139	63	23
Aug.	1,318	158	94	33
Sept.	1,432	293	147	40
Oct.	1,517	263	159	28
Nov.	1,266	262	210	33
Dec.	1,446	366	222	38
1963-Jan.	1,484	226	124	36
Feb.	1,646	400	230	75
Mar.	1,241	224	149	79
Apr.	1,438	195	105	50
May	1,160	282	127	69
June	1,208	168	165	33
July	1,440	172	134	29
Aug.	1,060	139	88	21
Sept.	1,280	207	214	100
Oct.	1,261	144	124	46
Nov.	1,300	252	131	29
Dec.	1,348	213	122	37

APPENDIX TABLE II (Continued)

Period	Within 1 Year	1-5 Years	5-10 Years	After 10 Years
	(Par Value in Millions of Dollars)			
1964-Jan.	1,656	264	159	65
Feb.	1,336	272	145	56
Mar.	1,361	213	81	31
Apr.	1,528	234	70	18
May	1,264	248	165	25
June	1,201	170	97	19
July	1,433	216	208	79
Aug.	1,099	197	123	34
Sept.	1,214	155	102	39
Oct.	1,476	141	92	41
Nov.	1,426	271	127	40
Dec.	1,596	261	146	49

[a]The transactions data combine market purchases and sales of U. S. Government securities dealers reporting to the Federal Reserve Bank of New York. They do not include allotments of and exchanges for new U. S. Government securities, redemptions of called or matured securities, or purchases or sales of securities under repurchase agreements, reverse repurchase (resale), or similar contracts. The averages are based on the number of trading days in the period.

Source: Federal Reserve Bulletin, various issues.

APPENDIX TABLE III

DEALER POSITIONS IN U. S. GOVERNMENT SECURITIES BY MATURITY[a]

Period	Within 1 Year	1-5 Years	After 5 Years
	(Par Value in Millions of Dollars)		
1960-Sept.	2,055	435	160
Oct.	1,749	402	143
Nov.	1,600	639	155
Dec.	2,341	510	126
1961-Jan.	2,338	519	113
Feb.	2,128	578	88
Mar.	1,600	388	90
Apr.	2,115	223	126
May	2,227	484	98
June	1,973	300	-20
July	2,247	323	40
Aug.	2,350	175	10
Sept.	2,339	144	15
Oct.	3,044	194	-12
Nov.	3,272	464	71
Dec.	2,655	260	23
1962-Jan.	2,589	184	5
Feb.	1,914	297	54
Mar.	2,721	228	106
Apr.	3,388	252	131
May	2,985	403	255
June	3,398	261	118
July	2,818	94	-32
Aug.	2,484	72	91
Sept.	2,643	323	211
Oct.	2,991	383	194
Nov.	3,319	447	256
Dec.	3,829	365	74
1963-Jan.	3,622	368	30
Feb.	2,863	473	74
Mar.	2,439	563	543
Apr.	2,934	355	178
May	2,810	640	44
June	2,666	347	80
July	2,505	357	21
Aug.	2,871	307	-82
Sept.	3,099	290	300
Oct.	2,899	196	444
Nov.	3,008	430	108
Dec.	2,800	295	-4

APPENDIX TABLE III (Continued)

Period	Within 1 Year	1-5 Years	After 5 Years
	(Par Value in Millions of Dollars)		
1964-Jan.	3,218	272	92
Feb.	2,787	468	219
Mar.	2,486	323	-34
Apr.	2,316	156	-78
May	2,670	164	253
June	3,217	91	167
July	3,121	229	468
Aug.	2,978	552	782
Sept.	3,302	373	280
Oct.	2,966	231	160
Nov.	3,073	479	140
Dec.	2,675	419	159

[a]The figures include all securities sold by dealers under repurchase contracts regardless of the maturity date of the contract unless the contract is matched by a reverse repurchase (resale) agreement or delayed delivery sale with the same maturity and involving the same amount of securities. Included in the repurchase contracts are some that more clearly represent investments by the holders of the securities rather than dealer trading positions. Averages of daily figures based on number of trading days in the period.

Source: Federal Reserve Bulletin, various issues.

VITA

Panos Konstas

Candidate for the Degree of

Doctor of Philosophy

Thesis: FROM BILLS ONLY TO OPERATION TWIST: A STUDY OF FEDERAL RESERVE OPEN MARKET OPERATIONS FOR THE PERIOD 1953-1964

Major Field: Economics

Biographical:

Personal Data: Born near Sparta, Greece, May 31, 1934, the son of Pericles and Christina Konstantarogiannis. Immigrated to the United States in 1952 and became a naturalized citizen in 1955 while serving in the U. S. Army.

Education: Attended grade school near Sparta, Greece; graduated from Gymnasium of Sparta in 1952; received the Bachelor of Arts degree from Michigan State University in June, 1960; received the Master of Arts degree from Michigan State University in August, 1962; completed the requirements for the Doctor of Philosophy degree in July, 1966.

Professional Organizations: Member of the American Economic Association.

Professional Experience: Served as a graduate assistant in the Department of Economics at Oklahoma State University for the years 1962-1965; employed as an Instructor in the Department of Economics, Wisconsin State University - Whitewater for the academic year 1965-1966.